June 16, 1958

Paper Trade Journal

Riegel's First Southern Paper Machine Starts Up

Mexico's First Newsprint Mill Has Unusual Design

Imperative Need for Cost Reduction
Foreman Education for Cost Reduction
Reducing Costs Through Safety

Pitch Control in Sulphite Pulp
Evaluation of Hot Press Installation
Non-Financial Incentive of Productivity

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Ann Arbor, Mich.

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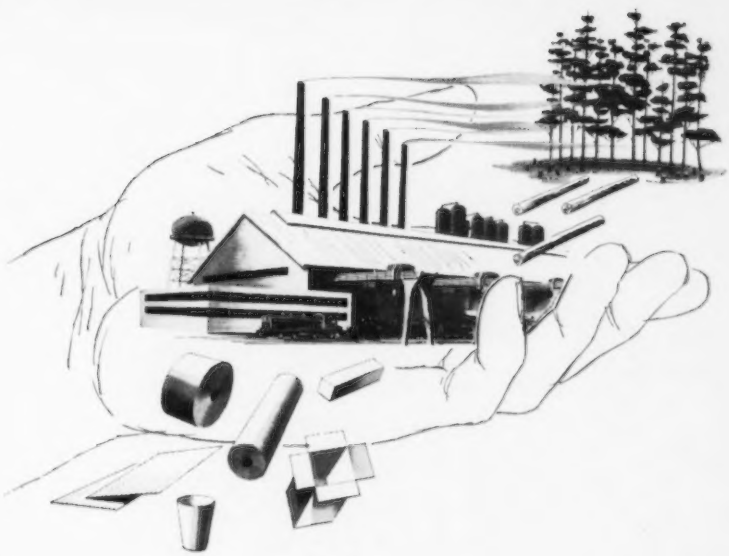

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Everything at Gottesman is geared to make good production performance easy for you. With Gottesman service, you are assured the right supplies for your specific needs—and prompt, expert handling in a wide range of grades. That's why you get superior performance, consistently.

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B.F.Goodrich

Photo courtesy The Crystal Tissue Company, Middletown, Ohio.

No holes, no leaks, no repairs—liquid alum stored safely in rubber

B. F. Goodrich improvements in rubber brought extra savings

Problem: This paper manufacturer wanted to cut costs by switching from powdered to liquid alum in their pulp mixture. But getting a tank to hold this corrosive solution was a problem. Wood tanks shrink, often leak. Lead-lined tanks require frequent repairs.

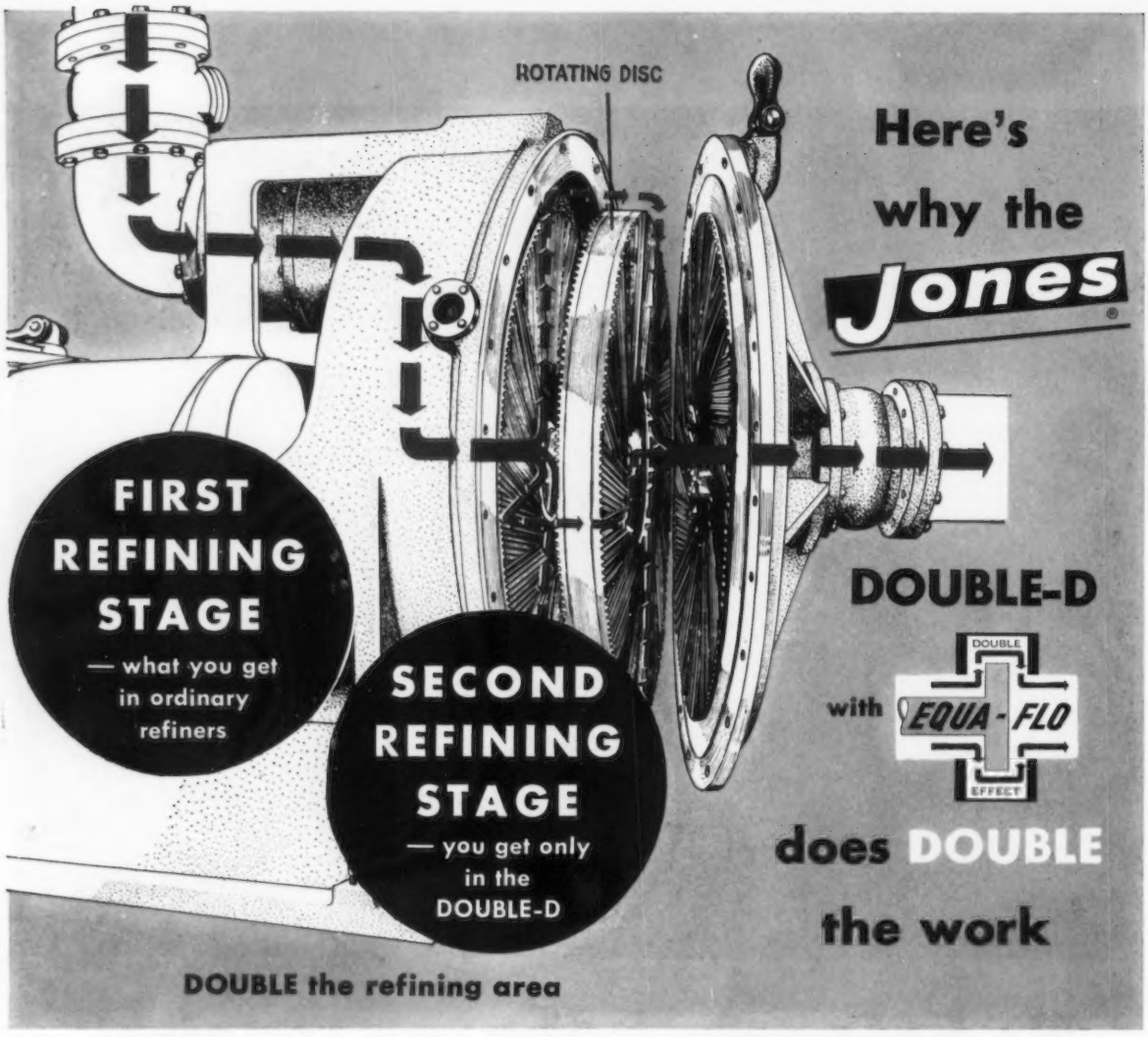
What was done: B. F. Goodrich engineers recommended Triflex rubber-lining for the two 5,000-gallon steel storage tanks. This lining is not one layer of rubber, but three—hard rubber for maximum corrosion resistance sandwiched between soft rubber for added protection.

Savings: Installed over 17 years ago, the B. F. Goodrich rubber-lined tanks pictured here are still in excellent condition, have needed no repairs on either the lining or the metal. The paper manufacturer feels that with proper care these tanks will last years more. Other tanks and pipe in the system are also B.F.Goodrich rubber-lined.

Why specify B. F. Goodrich: In the past 18 years, we have lined hundreds of tanks for alum service, as well as more than 75 railroad tank cars, several tank trucks, and thousands of pieces of pipe and fittings. While the initial cost of B.F.Goodrich rubber-lining is somewhat higher than wood or lead-lined tanks, the rubber-lined tanks do not leak, require little or no maintenance, and are, therefore, much more economical in the long run.

For more information, write *B. F. Goodrich Industrial Products Co., Tuscaloosa, Alabama, or Dept. M-357, Akron 18, O.*

B.F.Goodrich *industrial products*



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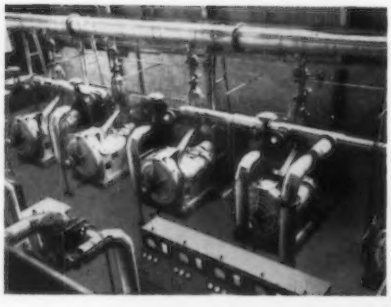
Equally important, mills everywhere report that the DOUBLE-D Refiner produces stock of better quality than conventional machines, with less horsepower hours per ton.

And because it is fully pressurized, the DOUBLE-D is economical to install, economical to maintain and extra-efficient in operation. Get the details — ask your Jones representative or write us for Bulletin EDJ 1083.



A typical installation - some of the 10 DOUBLE-D's at St. Regis Paper Company's Jacksonville plant. Note the piping - as simple as a Jordan's.

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Published Weekly Since 1872

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REMEMBER THIS DATE

July 28-Aug. 1: TAPPI Engineering Conference, Multnomah Hotel, Portland, Ore.

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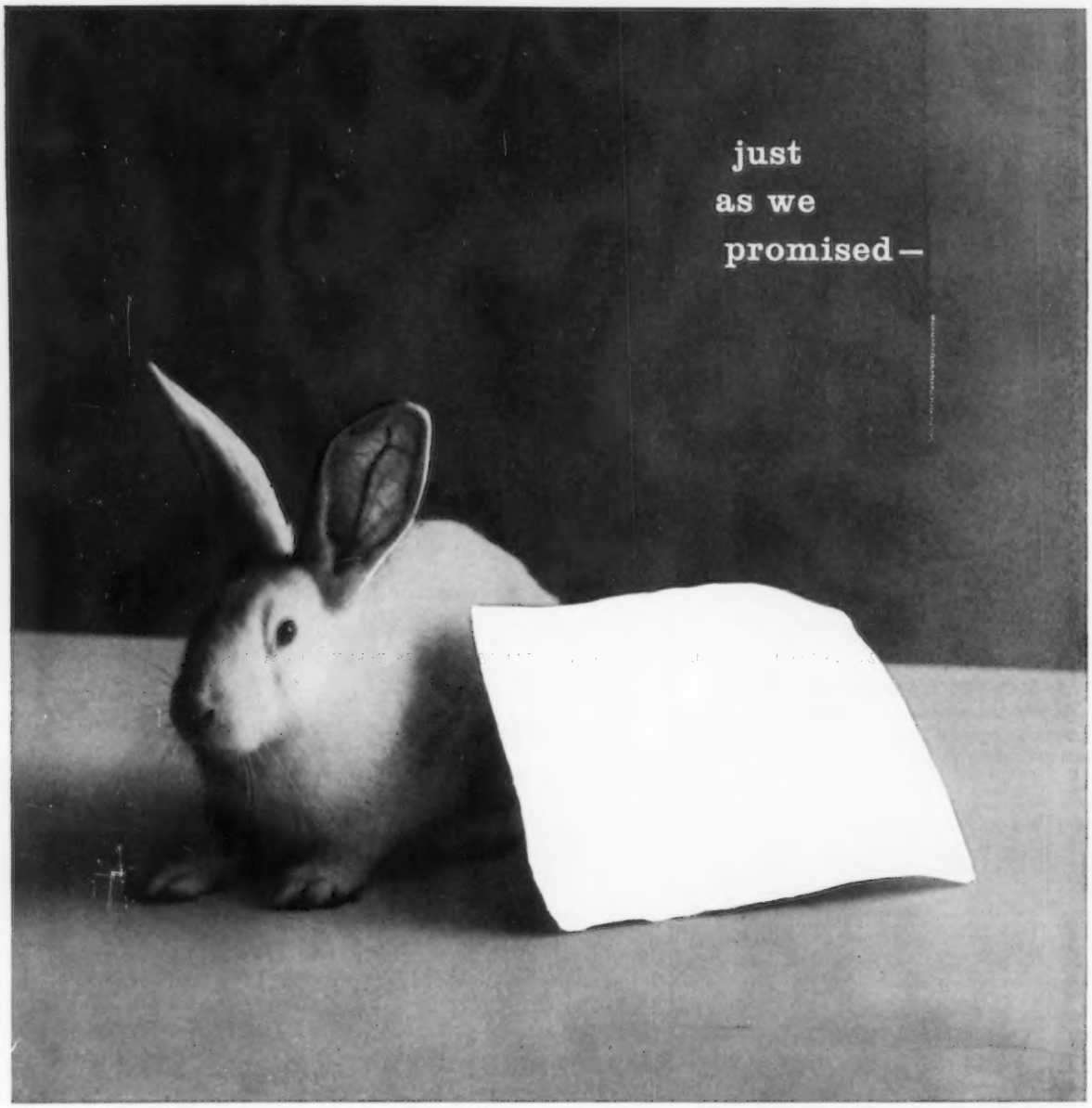

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3. **Liquid Cyclone** . . . centrifugally removes fine particles of foreign matter and heavier than water material. Automatic or manual reject discharge.

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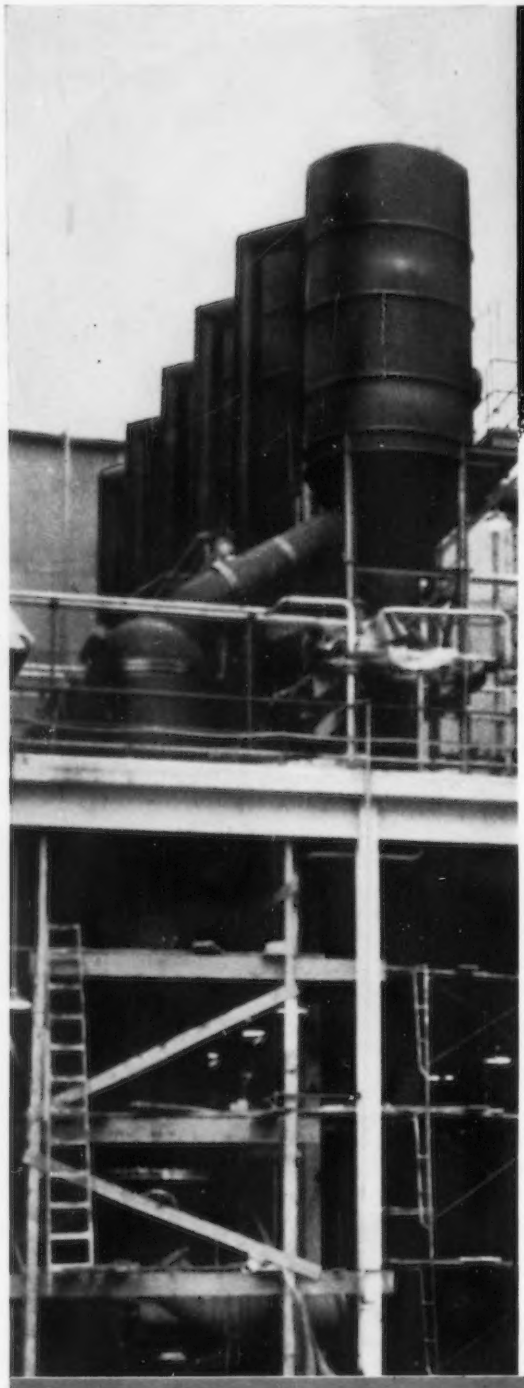

All-Stainless CONKEY EVAPORATOR

goes to work on MgO Process at Weyerhaeuser

- **Continuous heat transfer obtained with scale forming liquor**
- **Complete chemical and heat recovery effected from all waste liquor**

This Conkey® sextuple effect, forced circulation evaporator is now in regular operation on waste sulphite liquor from the MgO process at the new 400-ton Cosmopolis, Washington mill of the Weyerhaeuser Timber Company.

In order to insure continuous evaporation of this scale forming liquor, with minimum maintenance, the unit was fabricated of all-stainless steel. It is also designed so that continuous sextuple effect operation is maintained even when bodies are cut-out for cleaning.

This is another example of how Conkey Evaporators are engineered to provide economical, *continuous* performance at a high rate of heat transfer. They are fabricated and erected to exacting requirements in CB&I's four strategically located plants.

Our facilities include design, fabrication and erection facilities for steel plate and special, clad or partially clad, structures for the pulp and paper industry. Write our nearest office for complete information.

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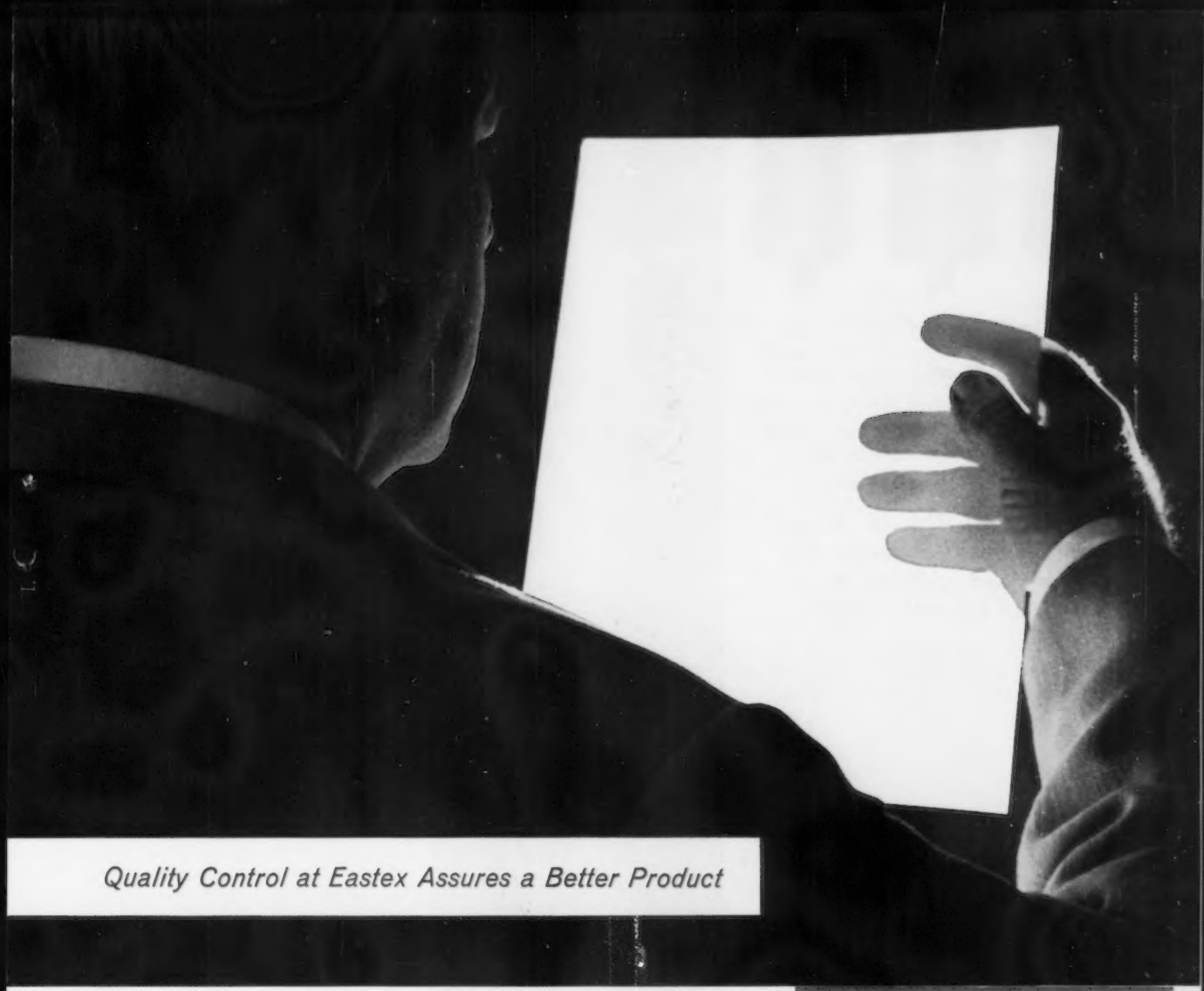
Weyerhaeuser's all-stainless, sextuple effect Conkey Evaporator is equipped with all controls for full automatic and continuous operation. Two other Conkey Evaporators are in operation in the same process at the company's Longview Mill.

PPC-21



Quality Control at Eastex Assures a Better Product

Here's What We Mean When We Say *Clean!*

We mean the kind of paper and board you want... consistently clean, completely free from defects.

Keep it clean is more than a chance phrase at Eastex—it's an operating procedure. This modern mill considers good housekeeping absolutely essential. Here, cleanliness begins in the woodyard and is a *must* all the way up through the pulp mill, on the paper machine, and right through the finishing room into the freight car.

This cleanliness pays off, too. You can rely on Eastex products to be free of paper defects. Another reason why the name Eastex is highly regarded by those who demand a quality product.

Eastex Grades available:

Chlorine dioxide bleached softwood and hardwood pulp

Bleached converting Fourdrinier board grades for: paraffined cartons, frozen-food containers, pails, plates, trays, liquid-tight containers, cold- and hot-drink cups, milk-bottle hoods, and many other miscellaneous grades

Texcote — Eastex's new solid bleached sulfate coated folding box board

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Semi-bleached grades of converting tag, file folder and tabulating

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TRENDS

JUNE 16, 1958

Paper and Board Rates Up and Down

During May the paper mills ran close to 86% of capacity and board mills at 85%. The paper rate was definitely off from April while board was up. We feel it necessary to keep pointing out that paper and board production is much higher than these rates of operation indicate due to the new capacity to produce that has been added in the last 12 months and is still being added every month. There are still about a dozen new paper or board machines to come into operation within a year.

Labor Contract Pattern Settling

It now appears that in most areas the unions in their negotiations are settling for very modest increases or other provisions. This of course only applies where the companies took a firm stand and it is fortunate for the good of the industry that most companies did. Settlements on the order of 3 per cent or 5 cents seem to be the pattern.

Pulp Production Off 4% from '57

Total U.S. pulp production was off 4% in April from a year ago. Pulp produced for own use was also off 4%. Domestic and foreign shipments declined 11%. Shipments to Latin America, though small, were up 35% and shipments to Europe showed a 3% gain.

Corrugated Box Decline Small

Manufacture of corrugated shipping containers in the first five months was just over 5% below the same period last year. Production for May as compared with May 1957 was off the same amount.

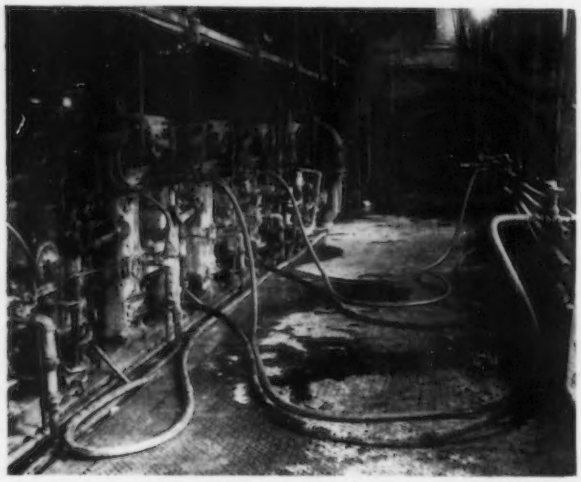
Good Job Well Done

Biggest problem of our industry today, "Costs," was a prominent feature of the Superintendents' recent annual meeting (reported in this issue). This realization of a problem and endeavor to help in the solution is a step forward. Too often the program of Association meetings such as these is made up on a heterogeneous basis apparently obtained "catch as catch can" without consideration of relevance or importance.

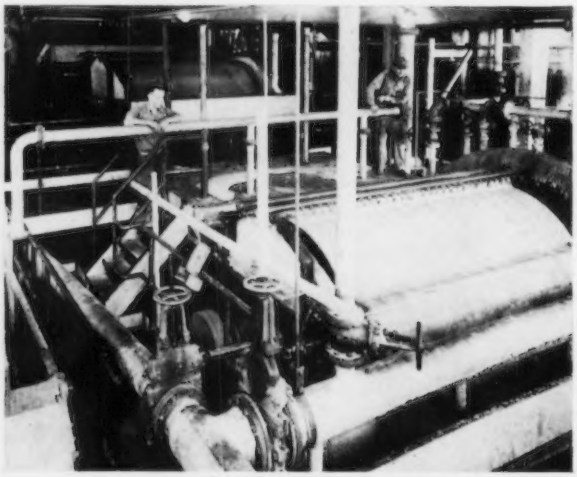
Employee Training Gets More Attention

Recently the industry has shown much greater interest in employee training programs. For example the pulp and paper conference on the subject in Washington last month (see next week's issue for a report). Employee training serves only one principal purpose, to reduce costs, both operating and maintenance. Undoubtedly the industry's great concern with rising costs has been an important factor in the attention to training.

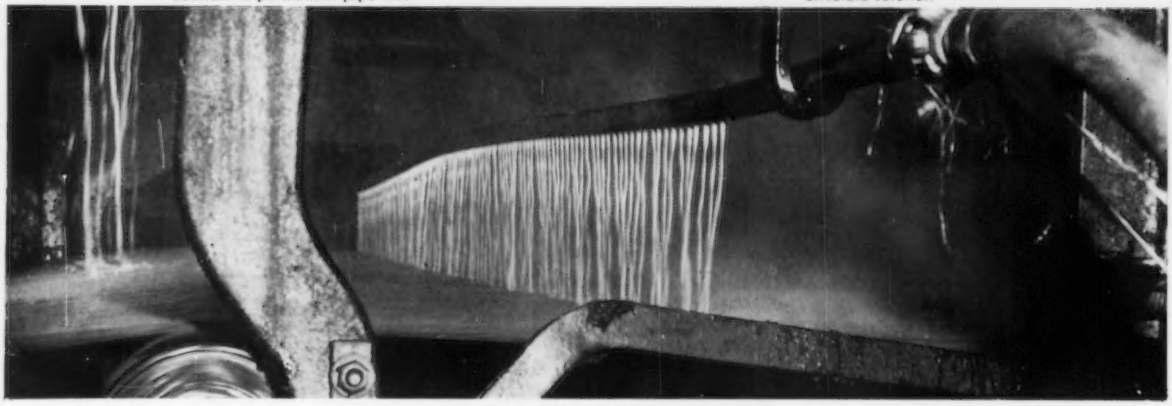
MODERN CLEANING SYSTEMS FOR MODERN PAPER MAKING



Connect to permanent pipe line



Circulate solution



Spray felts . . . job's done

Board mill slashes maintenance downtime with Oakite "Automated" Cleaning

Ever since it was installed, automated cleaning has been saving time and money at one Midwest board mill. *Unscheduled* cleaning downtime has stopped. *Planned* monthly clean-up is finished in a few hours.

Savings occur everywhere—suction press rolls are unclogged and spanking clean in less than a third of former time—felt is washed without downtime, *while it's still at work!*

How they did it. The Oakite man was asked to engineer a cleaning system for the entire paper making operation. He recommended permanent installation of detergent solution tank, manifold pipeline with couplings at each cleaning point . . . shower heads over felts and cylinders.

Hooked up fast. When machine stops, tanks are drained and loose pulp hosed down. The pipeline is coupled to cleaning points with sets of hoses; one supplies the shower heads, one returns drainage to tank. The Oakite solution circulates 1 to 2 hours . . . softening, loosening, floating dirt free. No more scraping or scrubbing . . . no work at all except inspection.

Felts are cleaned as needed, *while in operation.* Pushing a button sprays a detergent shower that's automatically rinsed off in 15 seconds.

How you can do it. Ask the Oakite man in your area to tell you more about the savings provided by Oakite engineered cleaning programs. Or, send for bulletin F4647. Oakite Products, Inc., 68 Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
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MATERIALS · METHODS · SERVICE
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In our 50th year.

Modern Cleaning Systems Keep Downtime DOWN

Export Division Cable Address: Oakite
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Riegel Starts Up "Carolina Belle"

Riegel's new "Carolina Belle" paper and board machine at Acme, N. C., had an extraordinarily successful start-up according to an announcement by John L. Riegel, president. During the long Memorial Day week-end, the paper crews installed the fourdrinier wire on the machine and ran pulp through the system. The operation proceeded so smoothly that it was decided to start making paper almost immediately.

Mr. Riegel stated that within 48 hours running time "Carolina Belle" was producing commercially salable quality paper, an unusual accomplishment for this type of machine. The first grade run was Riegel's Foldbrite, a full bleached kraft board for folding cartons.

(See complete story on Page 23.)

Peru Firm Orders Turbine-Generator

Primadera Nepena Peruana, S. A., of Lima, Peru, has placed an order for a 3,125 kilowatt steam turbine-generator unit with General Electric Co.'s Small Steam Turbine Department.

The unit, scheduled to be shipped in Peru early next year, will be utilized in expanding production at the Peruvian firm's hardboard and sugar mill.

The steam turbine, which will use steam initially at 600 psig at 750°F., will drive a 3750 kva air-cooled 2400/4160 volt, three phase, 60 cycle generator.

The order for the steam turbine-generator was placed through International General Electric, General Electric Co.'s overseas marketing organization.

St. Regis Workers To Get 5-Cent Raise

A five-cent-an-hour increase in pay for all job classifications in the northern New York mills of the St. Regis Paper Co. is included in the new contract reached between the company and union representatives.

The agreement is retroactive to May 1, the date when the old contract expired. The pay increase includes an additional five-cent-an-hour increase for May 1, 1959.

Alaska Pine Closing Pulp Mill

Alaska Pine & Cellulose Co., Ltd., Vancouver, B. C., said it will be forced to shut down indefinitely its pulp mill operations at Woodfibre, B. C. The closure, which will affect 240 employees, will go into effect June 21.

It is Woodfibre's second shutdown this year and the seventh since declining world markets forced a reduction of production a year ago.

"Continuing decline in the demand for the grades of cellulose produced at Woodfibre, a severe drop in shipments to Japan, and extreme competition from new plants owned by our customers necessitated the further shutdown," stated W. E. Breitenbach, executive vice president.

Market losses have not as yet affected the company's Port Alice mill, where a $14,000,000 expansion program was recently completed.

"But we have no assurance we can run Port Alice at full capacity for the rest of the year," Mr. Breitenbach said.

Pulp Waste Used to Replace Rubber

A Canadian government chemist has reported a new compound to replace natural rubber in tires has been developed in Canada from pulp waste.

Lloyd Kirchew of the National Research Council in Ottawa said the compound can be manufactured economically from lignan, which normally is dumped into rivers after extraction from pulp timber.

He told the Chemical Institute of Canada Conference that the new tires remain cool even at high speeds.

Restigouche Is Now Fraser Division

Fraser Companies, Ltd., on June 2 acquired as a going concern, all the assets of Restigouche Co., Ltd. and assumed all its liabilities. It will be henceforth known as the Restigouche Division of Fraser Companies, Ltd.

Restigouche Co. has for all intents and purposes been operated as a division of the parent company, but owing to its separate corporate entity, a great deal of duplication was required.

Allan Hyer

Joins Pusey & Jones as Vice President

Allan Hyer has joined the Pusey and Jones Corp. as vice president. Since 1918 Mr. Hyer has been active in the paper machinery industry. He was associated in his earlier days with Bagley and Sewall Co., Black-Clawson Co. in Hamilton, Ohio; and later with Black-Clawson's Paper Machinery Division in Watertown, N. Y.

Air Pollution Manual In Preparation

Work has begun at New York University's College of Engineering on the compilation of a comprehensive air pollution control manual for the National Council for Stream Improvement.

The manual, applicable to the fuel-fired combustion processes of pulp and paper mills, will outline the need and purposes of an air pollution control program and will contain a semi-technical discussion of methods of sampling and analysis of atmospheric pollutants, an outline of legislative aspects of the problem, a description of the instrumentation associated with this work, and a discussion of the means of compliance with state and municipal air pollution control requirements.

Newsprint Wage Talks in Conciliation Stage

S. A. Stephens, vice president, International Brotherhood of Pulp, Sulphite and Paper Mill Workers, accused Canadian pulp and paper companies of collusion in effort to block wage increases, says Toronto Globe and Mail.

In Quebec Province, four companies among others are now in conciliation after breakdown of negotiations, including St. Lawrence, MacLaren, Anglo-Canadian and Abitibi.

Most of the companies in Ontario are reported awaiting services of Ontario Labor Department conciliation officers.

Union wage talks with Canadian International Paper Co., postponed earlier, resumed in Montreal June 9. C. I. P. generally sets the pattern for wage settlements by other companies.

Olin Mathieson Develops White Coated Kraft

Development of an economical, white-coated kraft board is announced by the Packaging Division of Olin Mathieson Chemical Corp.

Called Omnikote, the product was developed under the direction of Dr. David C. Lea, research and development manager, at the Frostcraft Research Center, West Monroe, La.

Omnikote, now in limited production at Olin Mathieson's Frostkraft facilities in West Monroe, is a natural color fourdrinier kraft board, clay-coated on one side directly on the paper machine to give a white, smooth printing surface.

Oxford Paper Awards Scholarships

Two full scholarships for four years of study at the College of Technology, University of Maine, have been awarded to senior high school students by the Oxford Paper Co.

The scholarship winners are E. Staples Brown Jr., of Mexico High School, who is the son of an Oxford Paper Co. piper, first class; and C. William Ferguson of Stephens High School who is the son of Charles L. Ferguson, assistant mill manager for Oxford.

Groundwood Conference Program

E. H. Johnson, Stevens & Thompson Paper Co., Greenwich, N. Y., program chairman for the Third International Mechanical Pulping Conference, has released details of the tentative program.

Wednesday, Sept. 10—Opening Session

Opening remarks, by J. K. Kirkpatrick, Bowaters Southern Paper Corp., general chairman.

Keynote address, by Otto Brauns, Swedish Wood Research Institute.

"A New Method of Grinding," by Piero Bersano, Cartiere Burgo, Torino, Italy.

"A Cause of Wide, Uncontrolled Freeness Variation in Groundwood Production — The Varying Angle Between Stone Surface and Wood," by L. R. Beath, Price Bros. & Co.

"The Effect of Groundwood Pulp Quality on Paper Machine Operation," by G. Herwig, Finch, Pruyn & Co.

"Fundamentals of Groundwood Evaluation — A New Approach," by J. d'A. Clark, consulting engineering.

Panel Discussion: Fundamental Concepts. Panel: Otto Brauns, Swedish Wood Research Institute, Stockholm; J. d'A. Clark, consulting engineer; G. Herwig, Finch, Pruyn & Co.; B. Steenberg, Swedish Forest Products Research Laboratories.

Thursday, Sept. 11

"Control Testing in the Groundwood Mill," by F. W. Bishop, Southland Paper Mills.

Panel Discussion: "Tailoring Groundwood for End Use," E. P. Walsh, Anglo Canadian Pulp & Paper Mills, moderator.

Panel: S. R. Parsons, Consolidated Water Power & Paper Co.; C. A. Richardson, Blandin Paper Co.; W. J. Walker, Champion Paper & Fibre Co.; R. W. Leaf, Shawano Paper Mills; C. C. Porter, Southland Paper Mills.

Friday, Sept. 12

"A New Groundwood Bleaching Method," by K. H. Klemm, Munchen Dachauer Papier Fabriken, Munich, Germany.

"Two Stage Groundwood Bleaching," by H. Jacques and G. Rittenhouse, Finch, Pruyn & Co.

"The Use of Sodium Borohydride for Bleaching Groundwood Pulp," by C. P. Donofrio, College of Forestry, Syracuse, N. Y.

"Flash Drying of Groundwood in Crumb Form," by H. Sternberger Jr., Hearst Publications, New York, N. Y.

"High Consistency Screening," by A. E. Dentremont, and R. Swenson, Great Northern Paper Co.

Panel Discussion: Advanced Cleaning Methods. Panel: D. S. Burak, Escanaba Paper Co.; N. E. Ward, MacMillan & Bloedel, Ltd.; T. G. Shepherd, Donnacona Paper Co.; B. Steenberg, Swedish Forest Products Research Laboratories.

The three-day conference will be held at the Chateau Frontenac Hotel, Quebec, Que. Requests for accommodations should be directed to the hotel.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending May 31, 1958, was 80.9 per cent compared with 85.7 per cent revised for the preceding week. The ratio was 90.4 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending May 31, 1958, was 83 per cent compared with 85 per cent for the preceding week and 88 per cent for the corresponding week last year.

(Detailed statistics on page 18.)

NEWS OF CONVERTERS

St. Regis Expands Package Engineering Plant

St. Regis Paper Co. has completed plans for the expansion of its Engineering & Machine Division facilities at East Providence, R. I. The expansion consists of a 21,000 sq. ft. building addition, which will provide additional space for engineering development laboratory and shop and manufacturing.

The cost of the new building construction and improvements will total approximately $300,000 and the construction contract has been awarded to E. Turgeon Construction Co. of Providence.

The East Providence plant of St. Regis is the company's engineering and machine development headquarters for its packaging and converting plants, and is also the center of its machinery manufacturing facilities. The Engineering & Machine Division of the company was originally located in Chicago and was transferred to the company's Oswego, N. Y. location in 1929. It was later transferred to East Providence in 1953 when the present building was constructed.

In conjunction with the addition to the building, a major program of machine tool replacement has been under way in the past several months, and a large part of the new machinery has already been installed and placed in operation. Cost of this machinery was approximately $400,000.

The company announced that this expansion reflects the continued growth in demand for the firm's converting machinery by the paper industry and the requirements of an expanded program in the packaging equipment field. The latter development results primarily from the increased activity of St. Regis in the corrugated and folding box fields where the company now operates 18 manufacturing plants throughout the country.

Burt Co. Breaks Ground for New Plant

General Manager Raymond J. Lowe of the F. N. Burt Co. announced that ground will be broken in June for the company's new $3,500,000 manufacturing plant in Cheektowaga, N. Y.

The John W. Cowper Co. is the general contractor for the 440,000 sq. ft. building, which is scheduled for occupancy next spring. The air-conditioned structure will consolidate all Burt operations in the Buffalo area. About 800 to 900 will be employed.

The firm's three present facilities are the general offices and set-up box manufacturing plant at 514 Seneca St., containing about 300,000 sq. ft., a leased folding carton plant containing about 100,000 sq. ft. at 1298 Main St., and a warehouse of about 100,000 sq. ft. at 383 Babcock St.

Inland Appoints Packaging Engineer

Inland Container Corp. has appointed R. E. King as package engineer assigned to the company's sales office in Atlanta, Ga. He is currently employed at Inland's Macon plant.

Haines Retires from Kieckhefer-Eddy

Anthony Haines, vice president of the Kieckhefer-Eddy Division, Weyerhaeuser Timber Co., retired from active service May 31.

A veteran in the corrugated box industry, Mr. Haines began his career in 1919 with the Rockford Fibre Container Co. He moved to Chicago in 1932, when Rockford Fibre became a part of Eddy Paper Corp. He served as vice president, and later a director of Eddy until the Kieckhefer Container Co., Eddy and Weyerhaeuser Timber Co. merged in 1957. Haines then was elected a vice president of the timber company's Kieckhefer-Eddy Division.

Multiwall Bag Appoints Mundie

James A. Mundie has been named district sales manager of the newly-formed Multiwall Bag Division of West Virginia Pulp and Paper Co.

Headquarters of the new division will be in New York with regional offices at New York and New Orleans. The division operates plants at Wellsburg, W. Va., Mobile, Ala., New Orleans and St. Louis.

Sobel Corrugated Forms Subsidiary

Sobel Corrugated Containers Inc., producers of corrugated shipping containers in Cleveland, Ohio, has announced formation of a subsidiary, the Miles Folding Box Co.

Construction of folding carton facilities at 3215 E. 55th St. is now completed. Sidney Abrams has been named divisional sales manager for Miles Folding Box Co.

Rap-in-Wax Names Processing Engineer

G. R. Van Koersel has been named chief processing engineer at Rap-In-Wax, Minneapolis flexible packaging firm. The newly created post has been set up to provide a continuous processing improvement program, which in addition to product improvement will involve the training of personnel in the introduction of new and revised manufacturing processes.

Mr. Van Koersel was formerly in laboratory and product development work with the Nashua Corp., Nashua, N. H.

Milprint Appoints Eastern Manager

Gerald M. Minne has been named general manager of eastern manufacturing operations of Milprint, Inc., Milwaukee. The eastern plants are at Philadelphia, Downingtown and Christiana, Pa. Mr. Minne's headquarters will be at Downingtown. He was formerly assistant to the company's vice president in charge of manufacturing operations.

American Paper Moves into New Plant

American Paper Products Co. expects to move into its new $500,000 envelope manufacturing plant in Youngstown, Ohio, about the first of July. The company's East Liverpool plant is being closed and 100 of its employees will work in the new location.

Owen Elected Latex VP

Allen F. Owen has been elected a vice president of Latex Fiber Industries, Inc., Beaver Falls, N. Y.

He has been associated with Latex since it was formed more than 25 years ago. Until his election as vice president, he had been general manager of the company. In his new capacity, Mr. Owen will concentrate on forward planning assignments dealing with research and development efforts.

PAPER PEOPLE

Charles R. Walker

Ian A. Barclay

Elected Chairman of Fox Paper Co.

Charles R. Walker has been elected chairman of the board of the Fox Paper Co. succeeding Harold W. Nichols Sr. Mr. Walker has been with Fox for 40 years, serving in various capacities, the last nine years as president. He began his career in the paper business with Columbian Paper Co. of Buena Vista, Va. and later joined the Kingsport Pulp Corp. He comes from a long line of paper makers, his father having been associated with Hugh Burgess, who brought the soda process for the manufacture of soda pulp to this country around 1870. Mr. Walker's father was the first man to manufacture pulp and paper from spent chestnut chips.

Mr. Walker formerly was president of the Lightweight Chip Group of the National Paperboard Assn. as well as a former director of that Association.

Top Changes at Consolidated

C. Q. Baron, president and general manager of Consolidated Paper Co., Monroe, Mich., announces that Stanley J. Newcomer, formerly treasurer, vice president and general sales manager, is now treasurer, and vice president in charge of marketing and product development.

Kramer E. Verhoeven, formerly vice president and sales manager of the Corrugated Division, is now vice president and general sales manager.

Vincent C. Matthews has been appointed sales manager of the Corrugated Division.

Named Secretary of Columbia Cellulose

The appointment of Ian A. Barclay as secretary of Columbia Cellulose Co., Ltd. and Celgar Ltd. has been made by the board of directors of the companies.

T. N. Beaupré, president of Columbia Cellulose and Celgar, also announces the appointment of Mr. Barclay as assistant to the president.

Engineers Join Westvaco Covington Plant

Two engineers have joined the equipment engineering section of West Virginia Pulp and Paper Co.'s research center in Covington, Va.

They are W. George Kurasz and John P. Farrel.

Mr. Kurasz, who attended Danzig University and received his degree in mechanical engineering from Northampton Polytechnic Institute, London, England, comes to Covington from the Westinghouse Electric Corp. plant at Meadville, Pa.

Mr. Farrel attended Drexel Instittue of Technology, Philadelphia, Pa., and was previously employed by Black-Clawson Co. as a design engineer.

Baughman Leaves Allied

Robert M. Baughman has resigned as western sales manager for the Allied Paper Corp. He had been with Allied for six years. He is returning to Dwight Brothers, where he had been previously employed.

Crown Zellerbach Appointments

Sam Runyan, assistant men's personnel supervisor at Crown Zellerbach in Camas, Wash. has been named personnel and safety supervisor, St. Francisville.

Mr. Runyan joined CZ as an oiler in the West Linn woodmill in 1921. Transfering to Camas in 1928, he worked in the shipping and maintenance departments before going into personnel work there in 1946 as assistant to the training supervisor and, in 1950, retirement plan administrator.

In 1956 Mr. Runyan recruited the startup personnel of the St. Helens plywood division and later handled special assignments for the employee benefits department at CZ headquarters.

Vernon Morgan, leadman, sulphite mill maintenance, Camas has been named maintenance supervisor, sulphite, bleach plant and groundwood area, Camas.

Frank Lehn, general maintenance foreman, Camas was promoted to general maintenance supervisor, Camas.

Other CZ staff changes are:

Philip M. Schnabel, Jr., pulp mill superintendent, St. Helens — to wood mill and pulp mill superintendent, St. Helens, Ore.

Albert R. Abram, pulp mill shift supervisor, St. Helens — to pulp mill supervisor, St. Helens.

Charles J. Wallis, pulp mill cook, St. Helens — to pulp mill shift supervisor, St. Helens.

Don Desrys, journeyman electrician, Antioch, Calif. mill — to corrugating foreman, Antioch box plant.

Graves Promoted at International

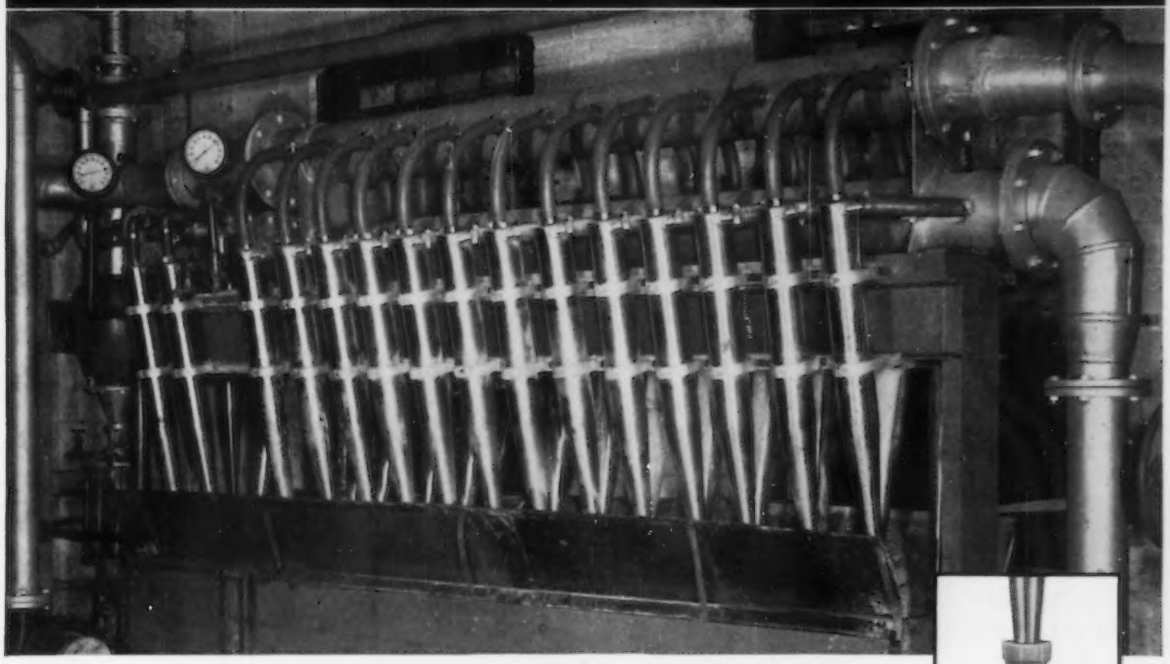
Wallace K. Graves, formerly sales manager of International Paper's Fine Paper and Bleached Board Division, has been promoted to assistant general sales manager of International Paper Co.

Shemanski Elected VP of K-C Canada

R. J. Shemanski, presently comptroller for Kimberly-Clark Corp., Neenah, Wisc., has been elected vice president of Kimberly-Clark Corp. of Canada Ltd.

Mr. Shemanski will be responsible for the financial activities of all Kimberly-Clark Corp.'s Canadian subsidiaries and affiliates. Formerly he was comptroller of Kimberly-Clark Pulp and Paper Co. Ltd., Terrace Bay, Ontario.

Pictured are thirty-six of seventy-five 4" Bird Cycleans handling deink stock. Cycleans are also available in 7" and 12" dia. Inlet capacities range from 36 to 850 gpm per Cyclean.



AUTOMATIC PURGE TIP WILL NOT PLUG
(Patent Pending)

These BIRD CYCLEANS *Are Bringing the Mill* FIVE BIG BENEFITS

1. **Quality and uniformity** — a truly tremendous improvement due to the superior ability of the Cyclean to remove shives and fine dirt
2. **Production** — an increase of ten per cent
3. **Wire life** — increased one third
4. **No more midweek washups**
5. **Machine breaks almost eliminated**

Bird Cycleans are compiling equally striking performance records on a variety of stocks in a growing number of mills. May we supply complete information, layouts and estimates?

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.
REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA 9, GEORGIA
Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

Mosinee Mill Announces Staff Changes

The board of directors of Mosinee Paper Mills Co. has elected Clarence Scholtens assistant secretary-treasurer of the company. He succeeds W. H. Knoedler Sr.

Elmer Batzer, who has been assistant cashier of the Mosinee firm since 1949, became credit manager also.

Mr. Scholtens joined the Mosinee mill in 1955 as controller. Mr. Batzer has been with the company since 1934.

Fibreboard Makes Two Appointments

Thomas F. Martin has been appointed administrative assistant to the general manager of Paper Division of Fibreboard Paper Products Corp.

Kenneth J. Busse was appointed to succeed Mr. Martin as technical superintendent of the company's Vernon Board Mill at Vernon, Calif., near Los Angeles. Mr. Busse's previous position was technical superintendent at Fibreboard's San Joaquin Pulp and Board Mill at Antioch, Calif.

Eastern Names Bristow to Sales Post

Eastern Corp. has appointed David C. Bristow as sales representative effective in the Atlanta district office. For the past twelve years he has been with the Whiting Paper Co., of Holyoke, Mass. for whom he has been Southern sales representative since 1953.

Braznell Named Champion District Manager

John C. Braznell has been promoted to manager of Champion Paper and Fibre Co.'s district sales office in St. Louis, Mo.

Mr. Braznell from 1936 to 1954 was an officer of Braznell Co., St. Louis, printing ink manufacturers. He joined the Champion sales staff in 1954 and has been with the St. Louis office since 1956.

Honorary Degree for Hammermill's Wilson

Norman W. Wilson, chairman of the board of the Hammermill Paper Co., Erie, Pa. received an honorary Doctor of Laws degree from Lawrence College at its 109th commencement ceremonies this month.

Mr. Wilson has been with Hammermill for 57 years. He was elected a vice president while still in his 20s, president in 1940 and Chairman of the board in 1953.

Mead Transfer

Donald G. Estebo, former general superintendent of Mead Corp.'s Harriman, Tenn. mill, has been transferred to Richmond, Va., as production manager of the Mead Heald division.

Growdon Advanced

Richard Growdon, former chief draftsman at the Chillicothe division of Escanaba Paper Co. has joined the engineering department as assistant division engineer.

Market Researchers Named

Hans G. Brandes and William G. Clark have been appointed to the staff of the Marketing Research Department, Marketing Research and New Products Division.

Demopolis Promotions

Two hourly and one salaried employees have been promoted at Gulf States' Demopolis plant. James Holt, former physical tester, is now a process evaluation engineer. Archie King Jr. and Jesse Lanier were promoted from machinists to maintenance foremen.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1958	May 3 89.2	May 10 87.2	May 17 87.9	May 24 85.7r	May 31 80.9
1957	May 4 95.5	May 11 95.8	May 18 96.4	May 25 94.9	June 1 90.4

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	86.9	89.5	89.5‡	87.4‡	—	—	—	—	—	—	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	90.7	81.5	90.9

‡Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	101.8	94.2	94.2	93.6	95.8	101.3	95.2	87.3
Year Average	98.0	88.6	92.3	91.6	94.0	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

1958	May 3 81	May 10 86	May 17 86	May 24 85	May 31 83
1957	May 4 94	May 11 95	May 18 95	May 25 95	June 1 88

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	80	86	88	84	—	—	—	—	—	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING May 31, 1958	LAST WEEK ENDING May 24, 1958	CUMULATIVE TO DATE Jan. 1 to May 31, 1958
% Activity	83%	85%	85%
	Tons	*Tons*	*Tons*
Total Production	247,209	259,071	5,594,167
Liner	73,492	86,411	1,819,849
Corrugating Material	35,609	36,584	825,550
Chip & Filler Board	5,343	6,421	102,044
Total Containerboard	114,444	129,416	2,747,443
Folding	54,725	48,402	1,112,622
Set-Up	10,423	11,445	221,907
Special Food Board	24,241	26,418	533,950
Other	43,376	43,390	978,245
Total Boxboard	132,765	129,655	2,846,724
Total Orders	*Tons*	*Tons*	
Received	264,648	242,408	
Unfilled End of Week	348,600	333,870	

ALBANY'S NEW IDEAS for better papermaking

New felt curing oven, developed by Albany research technicians, sets chemical treatments to provide more efficient operation

WHAT ALBANY RESEARCH MEANS

To date, Albany research has been responsible for the introduction of synthetic-content felts, a wide range of chemical treatments, the new DURASORB needled felt for asbestos-cement machines, and many other innovations in felt design and manufacture which have consistently set the pace for the industry.

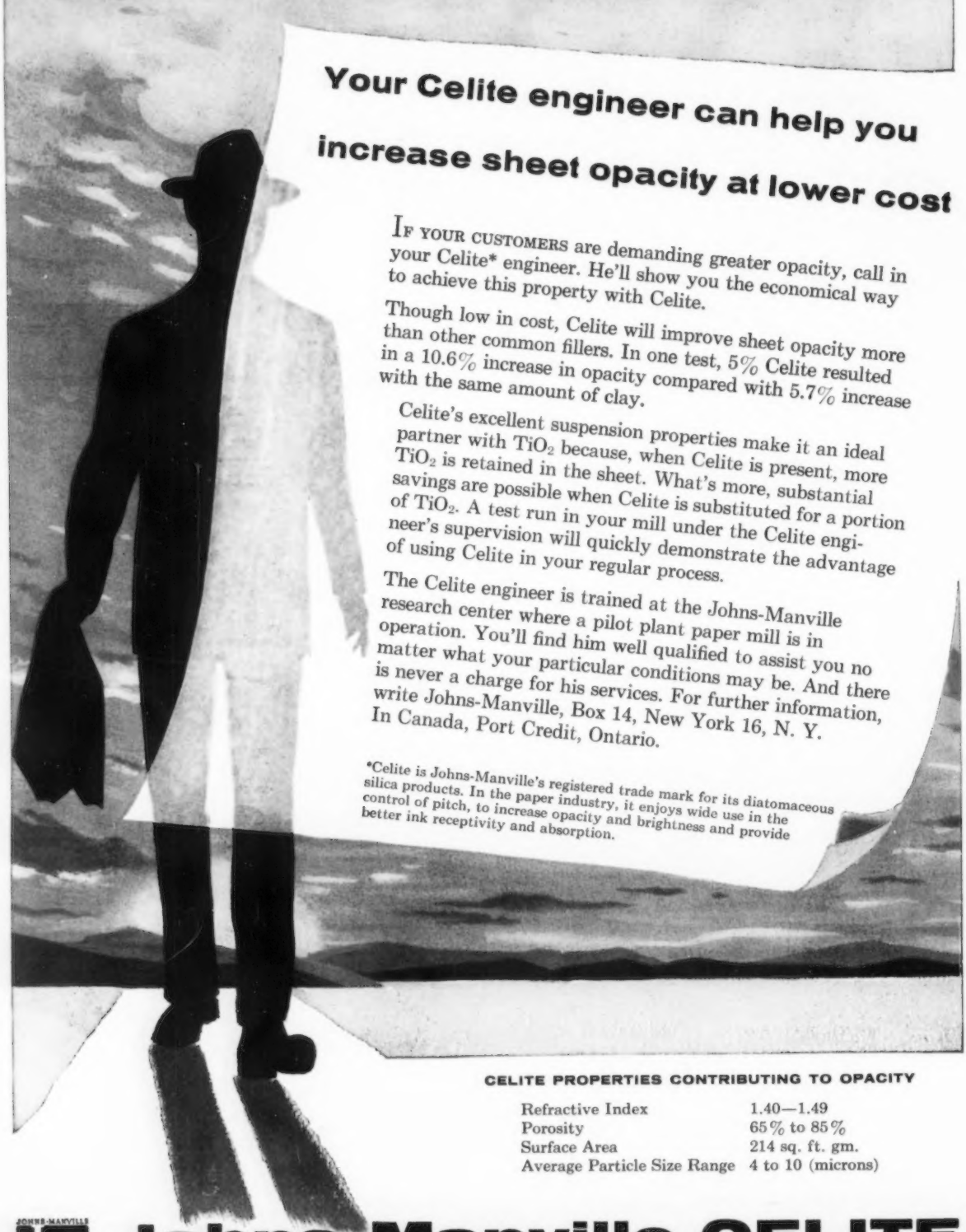
Today, Albany has accelerated its research activities in the industry's most modern chemical and mechanical laboratories, and through its Fellowship at a renowned research institution. As a result of this concentrated effort, developments such as the heat-treating oven are daily being applied in a new concept of felt manufacture, the results of which are already being seen in improved felt performance on paper machines everywhere.

This constant research improves Albany Felt's position as leader in the industry, keeps us ready to meet the demands of tomorrow's increased machine speeds and improved production methods. Our goal, as always, to help you produce more saleable tons per day!

ALBANY FELT COMPANY

MAIN OFFICE & PLANT, ALBANY, N.Y.
OTHER PLANTS: HOOSICK FALLS, N.Y.; N. MONMOUTH, ME.; ST. STEPHEN, S.C., COWANSVILLE, P.Q.
"THE WORLD'S LARGEST MANUFACTURER OF PAPER MACHINE FELTS"

Want Greater Opacity?



Your Celite engineer can help you increase sheet opacity at lower cost

IF YOUR CUSTOMERS are demanding greater opacity, call in your Celite* engineer. He'll show you the economical way to achieve this property with Celite.

Though low in cost, Celite will improve sheet opacity more than other common fillers. In one test, 5% Celite resulted in a 10.6% increase in opacity compared with 5.7% increase with the same amount of clay.

Celite's excellent suspension properties make it an ideal partner with TiO_2 because, when Celite is present, more TiO_2 is retained in the sheet. What's more, substantial savings are possible when Celite is substituted for a portion of TiO_2. A test run in your mill under the Celite engineer's supervision will quickly demonstrate the advantage of using Celite in your regular process.

The Celite engineer is trained at the Johns-Manville research center where a pilot plant paper mill is in operation. You'll find him well qualified to assist you no matter what your particular conditions may be. And there is never a charge for his services. For further information, write Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products. In the paper industry, it enjoys wide use in the control of pitch, to increase opacity and brightness and provide better ink receptivity and absorption.

CELITE PROPERTIES CONTRIBUTING TO OPACITY

Refractive Index	1.40—1.49
Porosity	65% to 85%
Surface Area	214 sq. ft. gm.
Average Particle Size Range	4 to 10 (microns)

JOHNS-MANVILLE PRODUCTS

Johns-Manville CELITE

PRODUCTS FOR THE PAPER INDUSTRY

Unusual and striking appearance of the mill is due to the design chosen to provide resistance to earthquake shock.

Mexico's First Newsprint Mill Goes Into Production

Half of the newsprint needed by Mexican newspapers is now being manufactured within Mexico at the new Fabricas de Papel Tuxtepec, S. A. de C. V. pulp and paper mill, which began operations early in June is Oaxaca State, 250 miles southeast of Mexico City. The mill has integrated facilities for producing 100 metric tons per day of newsprint from pine pulpwood.

Fabricas de Papel Tuxtepec, S. A. de C. V. has a fully paid in capital of 50,000,000 pesos, which is divided equally among Nacional Financiera S. A., the Parsons & Whittemore-Lyddon Organization of New York and London, and Dr. George S. Wise and interests associated with him. Dr. George S. Wise is acting as president of the company. The balance of the financing of $7,000,000 was secured by a bond issue guaranteed by Nacional Financiera S. A., and through medium term supplier credits with the participation of Parsons & Whittemore.

All equipment for the plant was obtained in a global contract from the Parsons & Whittemore-Lyddon Organization. The principal piece of production machinery, a Black-Clawson fourdrinier machine, was constructed by Black-Clawson International Ltd., London, England. Other paper mill and pulping equipment was manufactured by the Black-Clawson Co. in the United States. Equipped at present to produce 100 metric tons of newsprint daily, the mill is easily expandable to 150 tons capacity.

Unusual Building Design

Fabricas de Papel Tuxtepec is located at Tuxtepec in the Papaloapan river basin where the states of Puebla, Oaxaca and Vera Cruz come together. The plant, consisting of three main buildings—one for the pulp and paper mill and the others for wood preparation and steam and power generation—occupies approximately 97,000 square feet. Sandwell & Company Ltd. of Vancouver, B. C. acted as consulting engineers for the enterprise.

The pulp and paper making equipment is in a 592-foot long building of striking appearance. Chosen for its resistance to earthquake shock, the architecture employs a long line of short arches in the roof construction. These arches are supported by cement cross beams producing an interesting diamond shape pattern on the side walls of the building. The building is without windows, completely air-conditioned and finished inside and out with tile facing of all wall surfaces.

Process Flow

Production facilities for groundwood pulp have been established in excess of present needs to allow for simple expansion of the plant. At present no equipment has been put in for producing the necessary chemical pulp, but long-range plans call for the installation of a kraft pulp mill.

Logs are brought by truck to a wood storage area adjoining the mill site of 250 acres and production begins with chain conveying of the tree length logs to the mechanical barker. The debarked logs are then conveyed to a slasher which cuts the wood into 4-foot bolts. A log splitter has been provided to split over-size bolts. The 4-foot pieces then pass through a chain conveyor system which brings them to the groundwood mill. There are four Roberts grinders, each with a 3,000 horsepower, 257 r.p.m. motor. The grinders were built for Tuxtepec by the Black-Clawson Co., Pandia Division, Hamilton, Ohio.

From the grinders the groundwood goes to two Jonsson coarse screens. Accepted fiber flows from the Jonssons to a coarse screened stock chest from which it is pumped to two primary Cowan screens. The rejects from the Jonssons go to a Jeffrey shredder and into a reject chest. The rejected fiber from the Cowan primary screens passes through a Cowan secondary screen which returns accepted fiber to the coarse screened stock chest. Rejects from the Cowan secondary also return to the reject chest. These rejects will be reclaimed, passed through a coarse refiner and be added to the coarse screened groundwood chest. Accepted stock from the primary Cowans is pumped to two Dorr-Oliver deckers where water is removed and reclaimed as cloudy white water for screen stock dilution and showers on the grinders. Deckered stock is stored in a stock chest from which it is pumped through an automatic consistency regulator to the groundwood blending chest. From this chest the stock flows through an automatic proportioner and is metered to the paper machine chest.

The stock is then pumped to a Black-Clawson No. 6 jordan, from the jordan to a stuff box, from the stuff box to a mixing tank and thus to three Selectifier screens ahead of the paper machine. Rejects from the Selectifiers pass through a Jonsson tailing screen which returns fiber to the mixing tank and lets rejects flow to the sewer.

Kraft pulp is mixed into the machine furnish at the machine chest. The pulp

is received in bales and moved by conveyors from storage to the kraft pulp Hydrapulper where it is broken up and slushed to a dump chest for in-line storage. From the dump chest the kraft stock flows through an in-line consistency regulator to a Black-Clawson 4B Hydrafiner. The refined pulp is then added at the machine chest.

Papermaking

The complete paper machine and pressure-type headbox were designed and built by Black-Clawson International in London and Newport, England. The cantilever paper machine carries a 185-inch wide wire and is equipped with seven flat boxes, a suction couch roll, and lump breaker roll at the end of the wire. There are two straight-through suction presses, hydraulically-loaded, followed by a dryer section consisting of thirty eight 60-inch dryer rolls. Completing the paper machine are a nine-roll calender stack, an automatic reel, and a Black-Clawson, Model 40 2-drum winder. The rolls of newsprint from the winder are handled on floor trolleys to a roll head press and are moved to storage on a lowerator.

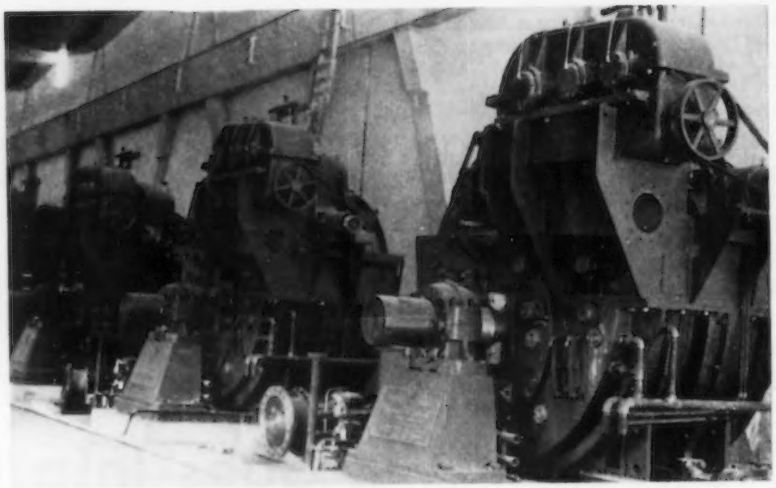
The paper machine is driven by a 1000 horsepower steam turbine line-shaft with variable-speed, V-belt take-offs to Black-Clawson spiral bevel gear drives on the various sections of the paper machine. The drive units were manufactured by Black-Clawson in Hamilton, Ohio.

Power for the plant is being supplied temporarily by Diesel generator units, but by 1959 the Papaloapan Commission is expected to have completed a hydro-electric installation which will supply the necessary kilowatts for Tuxtepec. The plant is equipped with four 2000 kw. unit sub-stations, two 500 kw. transformers, and a complete power distribution layout. There are also emergency generators for 600 kilowatts.

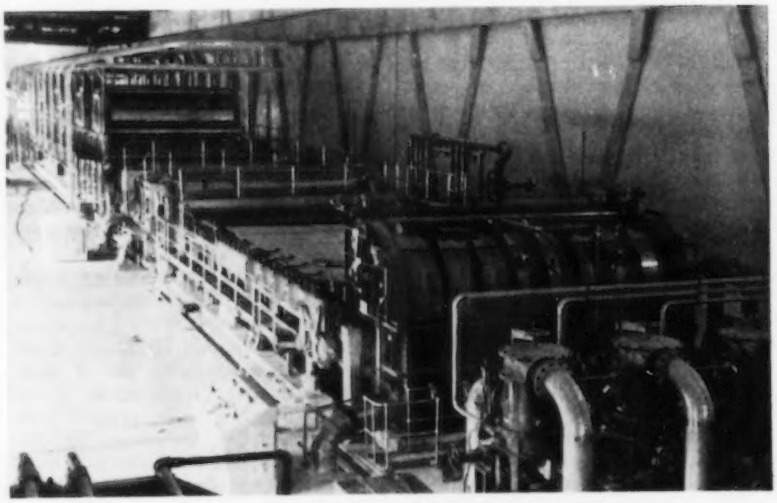
Other equipment for the plant includes a 4-well water supply system which pumps to a reservoir on a nearby hill. Steam is generated by two oil-fired, low pressure boilers with a capacity of 36,000 tons per hour. The mechanical maintenance shop is fully equipped with a large shop crane, lathes, milling machines and one roll grinder, and one suction box conditioner.

Model Housing Zone

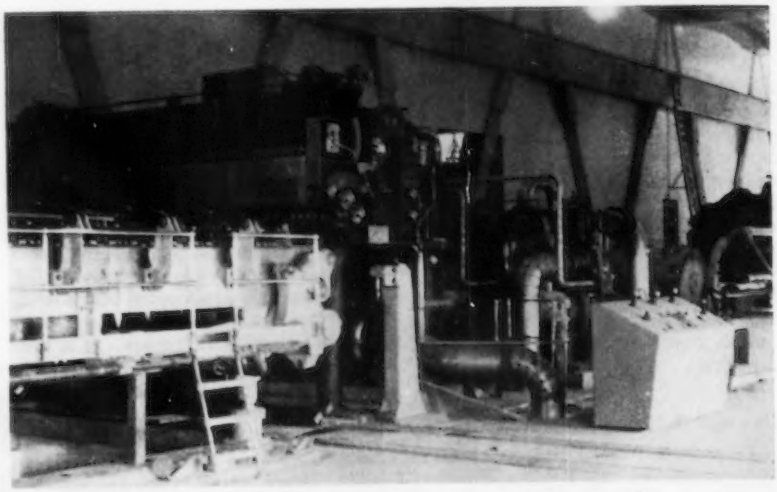
The Mexican Government has maintained a keen interest in the progress of this project and is said to be gratified by the completeness of the planning, which has resulted in construction of a neat and modern housing community for mill operating personnel.



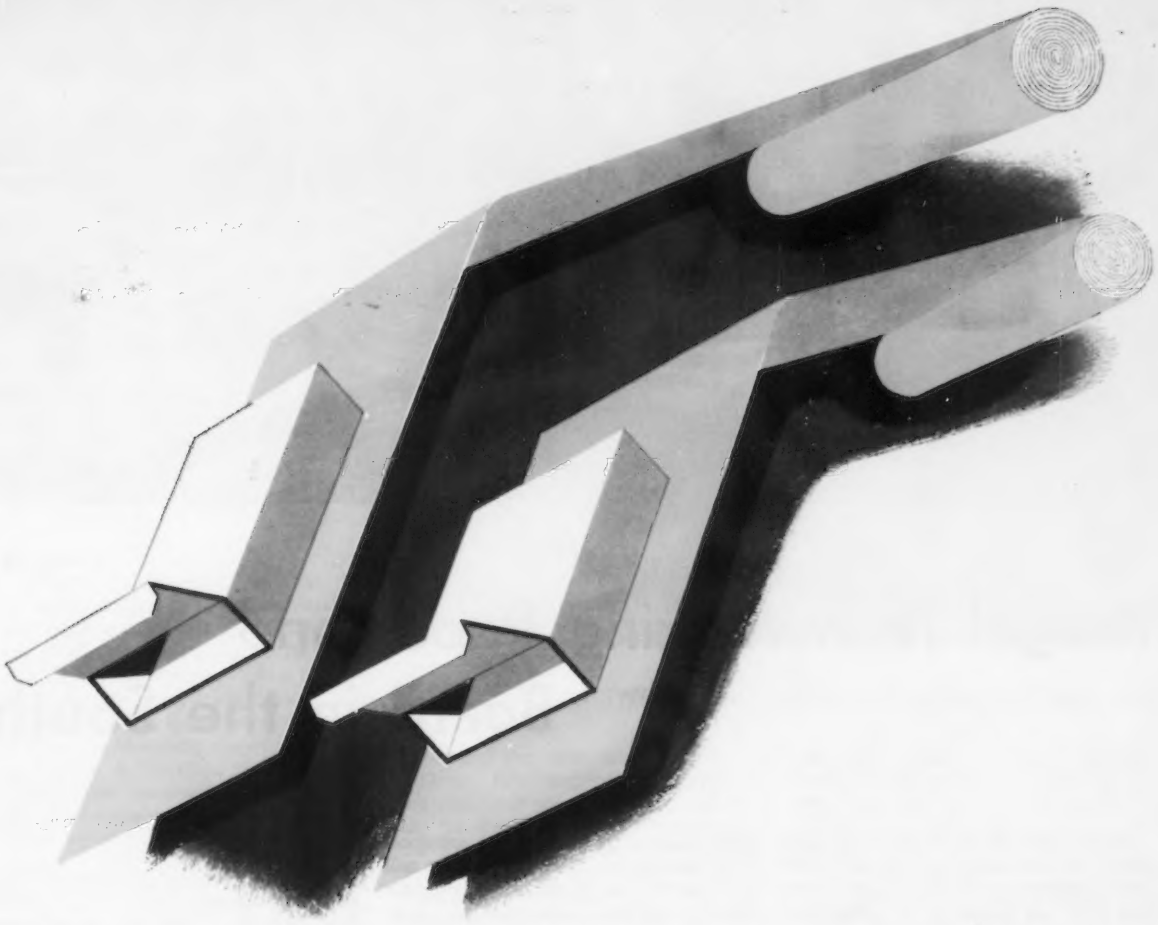
FOUR ROBERTS GRINDERS make pulp in machine room.



SELECTIFIER SCREENS and pressure headbox dominate this view.



PAPER MACHINE HEADBOX. Note pulp grinder alongside, at right.



Your customers in the food industry need the protection of—

IONOL®, C.P.-impregnated packaging

• Ionol, C.P.—an extremely effective antioxidant—provides a new and better way to solve a troublesome problem for food products manufacturers.

One of the serious threats to the quality of many food products is rancidification, which destroys both flavor and aroma. Deterioration of this kind occurs most frequently during storage on the retailers' shelves. Products which suffer most from rancidification are those containing fats or oils, such as baked goods, cereals, meals, shortening, packaged meats and butter.

When Ionol, C.P. antioxidant is incorporated into boxboard or wrapping materials in which fat-containing products are packed, it protects against rancidity by retarding oxygen attack on fats—right where it starts—at the surface of carton and wrappers.

In tests, baked goods stored at 85°F in boxboard cartons impregnated with Ionol, C.P. were free of rancidity at the end of 90 days. Without Ionol, C.P. protection, packaged baked goods stored under similar conditions often become rancid within a week.

Be among those who offer their customers this effective new packaged foods protection. Write for technical bulletin SC: 55-43, "Ionol, C.P. for Impregnating Paper and Boxboard," or contact our nearest district office.

SHELL CHEMICAL CORPORATION

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SHELL

Riegel Now Making Paper and Board in the South

Early in June, Riegel Paper Corp. completed the successful start-up of its first paper machine in the South, its "Carolina Belle" at Acme, N. C. This new large fourdrinier which will produce bleached papers and boards is the latest step in expansion of Riegel's Acme plant. In 1937 the company made plans for its Southern growth and acquired woodlands and a mill site, a few miles from Acme. Decision to go ahead with the project was delayed until 1950 when construction of a 200-ton-per-day market pulp mill to produce bleached hardwood and softwood kraft was begun. Shortly after the mill was started up facilities to produce neutral sulphite semi-chemical pulp were added. Original purpose of the plant was to manufacture pulp for Riegel's New Jersey mill and for the general market. The paper machine project has not changed this purpose.

Capacity of the pulp mill continued to grow, until it reached 450 tons per day in 1955. Shortly thereafter it was decided to add another 50 to 100 tons per day and install a paper machine for bleached papers and boards.

Pulp Mill

The pulp mill now has nine stainless steel clad digesters, each of 3,300 cubic foot capacity. These are so arranged that any one of them may be used to produce hardwood or softwood kraft or neutral sulphite semichemical pulp. There are three blow tanks, one for each type of pulp.

Stainless steel knotters precede the three washing lines. The three lines of washers fed from the three blow tanks feed into separate storage tanks. The softwood kraft line has four 8-foot by

Key Personnel at Acme

C. E. Hartford
Vice President and Manager

A. L. M. Bixler
Manager of Paper Production

J. D. Dailey
Manager of Pulp Production

10-foot washers; the NSSC line has two 6½-foot by 14-foot washers; and the hardwood kraft line has two 11½-foot by 14-foot washers plus one 9½-foot by 14-foot unit.

Pulp cleaning is obtained with three types of equipment: Cowan centrifugal screens, stainless steel flat screens, and Centri-cleaners.

In addition to large storage chests for each of the three screening systems, there is an even larger—65-ton capacity at four per cent consistency—storage chest in the line handling the greatest production (softwood kraft). These large low consistency blending chests are unique in the field. They permit a more thorough blending of a number of digester charges, thus insuring uniformity of quality through the bleach plant and on to the paper machine.

Bleaching

Riegel's Carolina mill was the first to have a chlorine dioxide bleaching process in a plant making primarily paper grade pulps. To add to the Carolina plant's uniqueness, it was the first to have two bleach plants with two chlorine dioxide stages in each.

The two bleaching plants are staged as follows: A five-stage plant for hardwood pulps consists of chlorine, followed by caustic, chlorine dioxide followed by caustic, followed by chlorine dioxide. The five-stage plant is used for both the hardwood kraft and NSSC pulp. A six-stage process is used for the softwood kraft. It is very similar with the exception of the addition of a hypochlorite stage after the first caustic treatment.

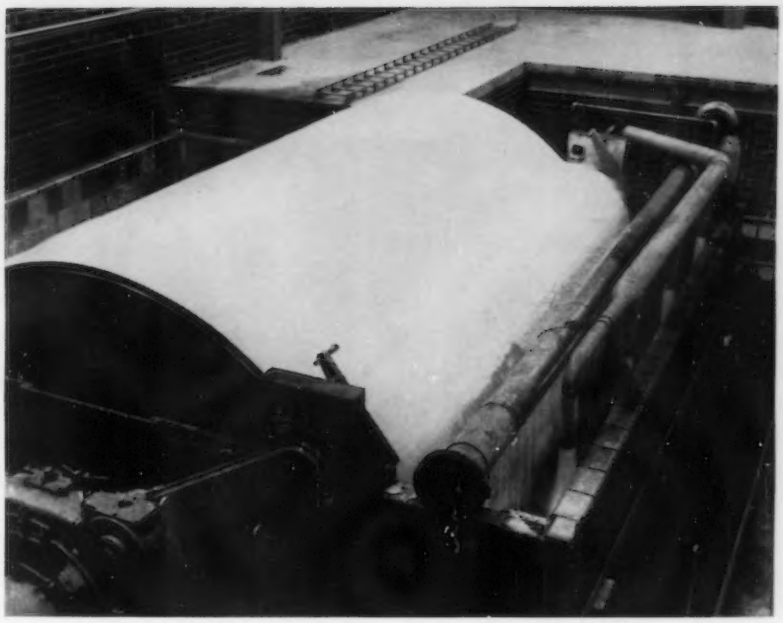
The five-stage plant for hardwoods was started-up last year. Prior to that the mill produced the three different types of pulp alternately in one bleach plant.

Riegel's market pulps are named as follows: bleached softwood kraft is called Albacel; bleached hardwood kraft is Astracel; and the bleached neutral sulphite pulp is Miracel. In addition the plant produces a semi-bleached softwood kraft called Auracel.

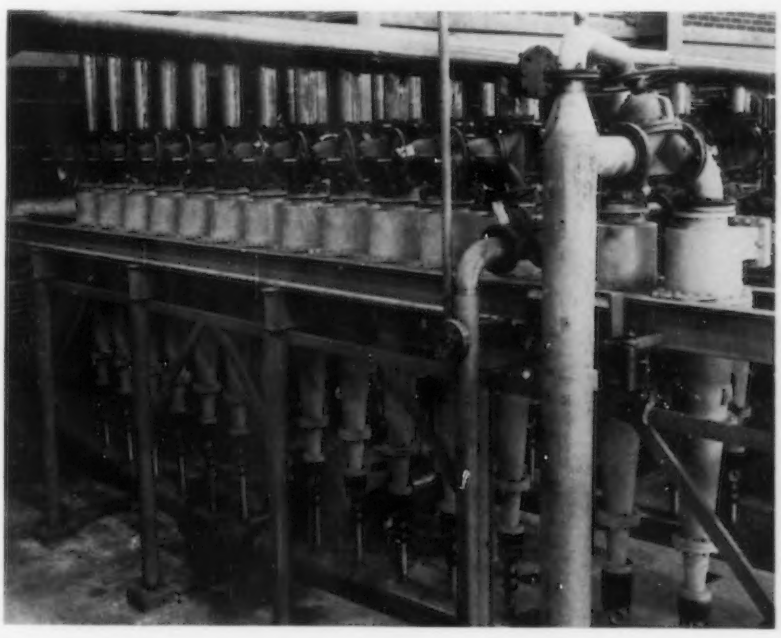
Stock Metering

Just before primary refining, there are three stock chests. One is for softwood (kraft) pulp, one for hardwood (kraft) pulp, and one is for broke. The broke chest receives its stock from the two Hydrapulpers and from a saveall. Following the three stock chests there are several consistency regulators and flow meters. The operator sets the dial on an instrument panel for the desired percentage of hardwood pulp and broke in the furnish and the instruments take over. Stock from the softwood chest is pumped through the consistency regulator and the flow meters on to the jordans. The hardwood kraft after being regulated for consistency and having the flow measured is introduced to the softwood line ahead of a centrifugal pump. The broke after having its consistency regulated and the flow measured is injected into the hardwood kraft line just before it enters the softwood line before the pump. The three flow meters are tied together so that they operate valves to maintain the proper proportion of the three components of the furnish at all times.

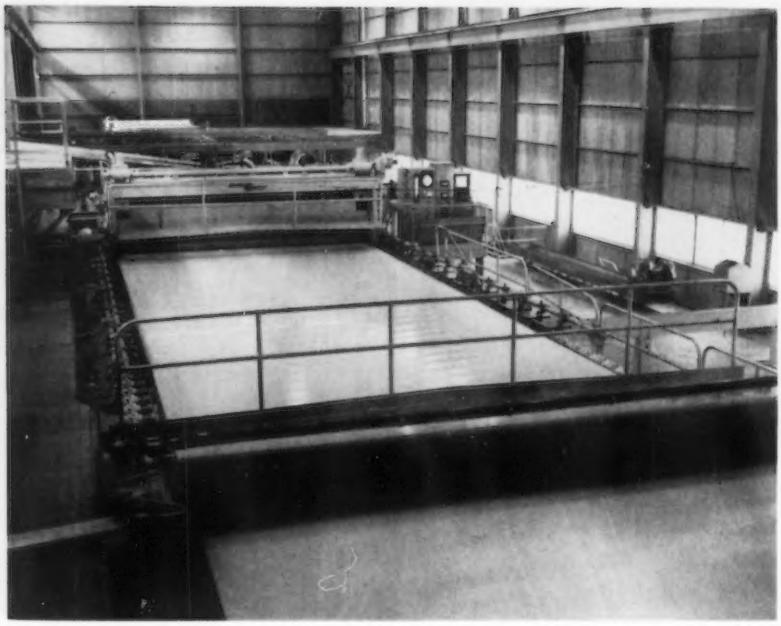
There is a breaker trap in the broke line. This is in effect a fixed setting refiner to defiber small pieces of broke that may not have been completely de-



VACUUM DECKER TYPE SAVE-ALL handles wet end broke and white water.



CENTRI-CLEANERS provide final cleaning before paper machine.



VERY LONG WIRE (157 feet, 4 inches) is emphasized in this fourdrinier view.

fibered in the Hydrapulpers under the calender stacks.

Just before the primary refiners, there is a magnetic separator.

A bale pulp Hydrapulper adds to flexibility. With this pulper, the machine can be furnished with stock from dry bale storage should there be any breakdown in the continuous slush system. Another purpose for the Hydrapulper is to permit incorporation of special pulps into the system.

Refining Equipment

Through the years Riegel has made many studies of refining at their Jersey plants. As a result, Riegel has selected jordans as the most suitable for the Carolina mill.

The jordans are divided into two groups. There are five in the primary group and three in the finishing group. The primary group does most of the hydrating and the bulk of the refining. The finishing group has narrower bars and will be used to cut the fibers in a final treatment just as the stock goes on the machine. The piping and valves at the refiners are such that one or any number of the refiners may be bypassed at any time simply by turning a valve.

The refining set-up embodies all of the latest and best thinking today, including pressure refining. Varying the pressure on the stock during refining is not new, and many claims have been made for it in the past. Up to now, there were always limits to the pressure. The packing would blow out. Recently the Shartle Division of Black-Clawson has been able to build jordans that will operate under relatively high pressures. All the jordans are of this type, and will be operated under pressures up to as much as 85 pounds per square inch.

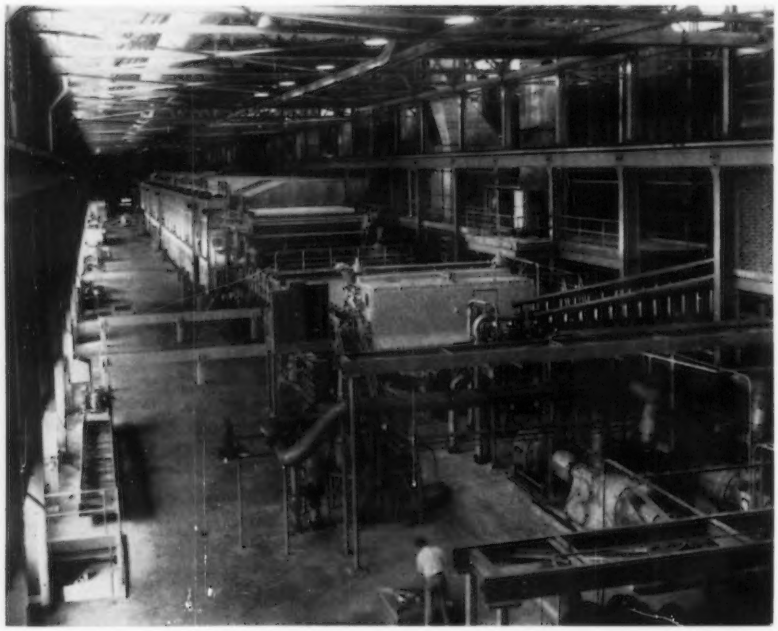
Stainless Steel Widely Used

For utmost in cleanliness, the mill has all stainless stock and white water systems. Type 316 stainless steel piping, valves, etc. are used. Wet end of paper machine is all stainless steel clad. Many pumps are solid 316, others stainless steel trim. The three Hydrapulpers are solid 316. Jordan fillings are 316. All chests are tile lined.

Fortified rosin size is added to the stock as it leaves the machine chest, and just before the pump to the secondary refiners. The pump acts as a mixer. Riegel also adds the size late in the system because better results are achieved when the stock is refined before the size is added.

Centri-Cleaners

The Carolina Belle has 25 primary Centri-cleaners, three secondary Centri-cleaners, and one tertiary Centri-cleaner. All the stock goes through the primary cleaners passed on to the machine; rejected stock passes to the secondary cleaners and is diluted with white water on the way. Stock accepted from the secondary cleaners is put back into the flow ahead of the primary cleaners. Stock rejected from the secondary cleaners is passed to the tertiary cleaner and diluted on the way with white water. The stock accepted from the tertiary cleaner is returned to the inlet of the primary cleaners; rejected stock from the tertiary cleaner is passed to the sewer.



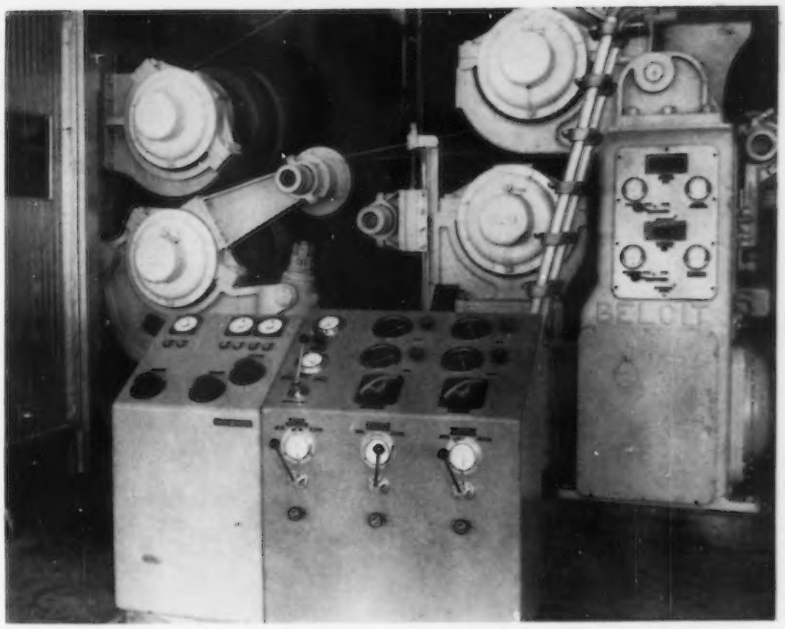
FINAL JORDANS, cleaners and headbox are prominent in the foreground.

Stuffgate and Headbox

The stuffgate of the new machine is a valve specially designed to permit accurate and reproducible settings. A constant pressure is applied to the valve by maintaining a constant level of stock in the stuffbox. The constant pressure, together with consistency control, insures that a uniform weight of fiber will be fed to the machine for any given gate setting.

The stuffgate is in the basement of the mill at the wet end of the machines but is remotely controlled. This setting is done either manually from a point near the testing station at the dry end of the machine or automatically by the Accuray basis weight-control instrument.

The headbox is the latest type of Beloit pressure inlet. Something that is unique about Riegel's headbox is an indication and recording of the position of the streamflow valve which is the large valve directly before the headbox and which controls the consistency of the stock on the wire for any given speed and weight. This gives a record in terms of direct machine operating data so that when a repeat run is made, the machine tender can easily set up his machine to duplicate the conditions of the run selected as standard. This can be done accurately and quickly without even waiting for the laboratory to make the usual gravimetric tests. The Carolina mill now goes one step further by recording the reading, as well as having it indicated.



SMOOTHING PRESS evens out the sheet shortly after it enters the dryers.

Fourdrinier

Carolina Belle's wire is 236 inches wide and 157 feet 4 inches long. Most machines of this type use wires about 130 feet long. The wire is driven from a wire turning roll which follows the couch; in addition, three of the wire return rolls have helper drives on them. The couch is also equipped with helper drive.

Presses and Dryers

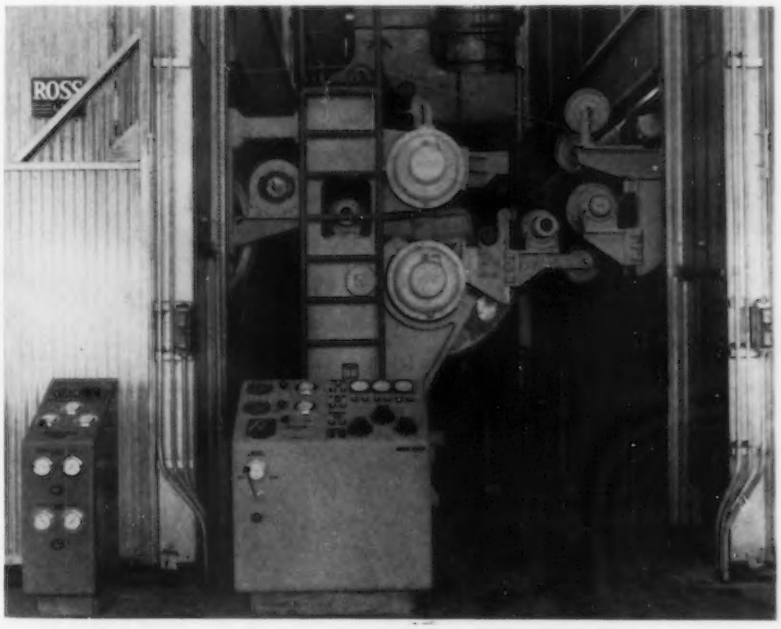
The first press has a typical suction roll. The second press is an inverse press, a new type with the suction roll on top. This gives the effect of a reversing press without the added complication and expense in the machine of reversing the sheet and running it backward to a press. The third press is a hot press, located after the first six dryers on the machine.

The machine has 72 paper dryers and 18 felt dryers, or a total of 90 dryers before the calender stacks.

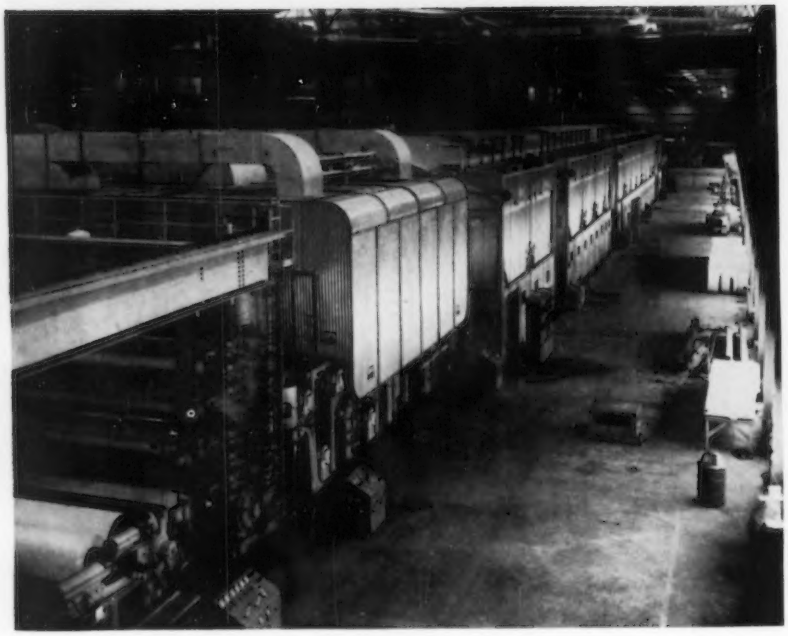
The closed hood starts at the predryers and is separated into the sections at the third press, smoothing press, breaker stack and the size press to give the operators full access to these units.

The machine is equipped with electric eyes so that a break anywhere inside the hood automatically raises the large doors on the front side of the hood so the machine crews can get at the point of the trouble. As previously indicated the machine is equipped with a size press and a breaker stack. There is a Mt. Hope roll after the size press.

The machine is equipped with an air knife coater. A special feature of the coater is a 51-foot long air drying



SIZE PRESS FOLLOWS the breaker stack and may be used for sizing or coating.



DIVISION OF HOOD in separate sections is indicated in this shot.

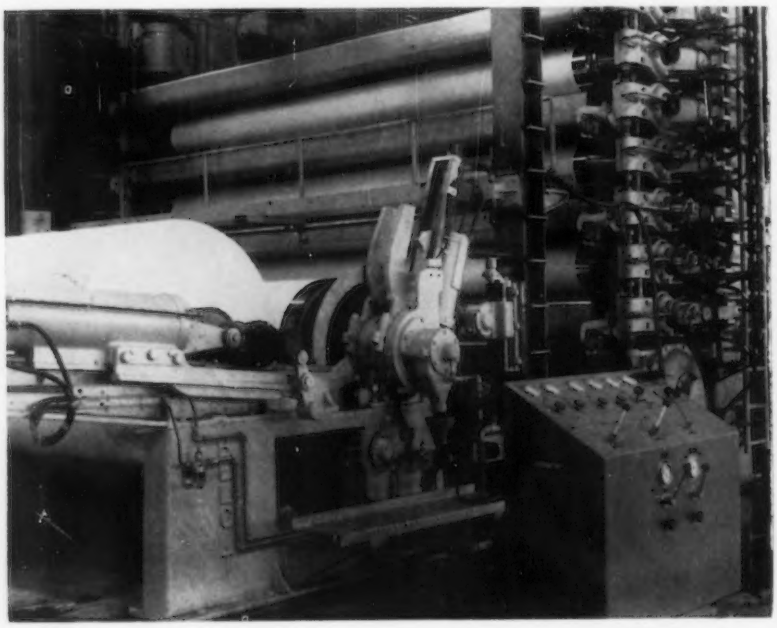
loop. Coater and coating dryer are located between the two calender stacks.

Moisture Control Instruments

Automatic moisture control instruments by Foxboro and Stamm are installed at three places in the dryer section:

1—Just ahead of the breaker stack.
2—Just ahead of the size press.
3—Just ahead of the first calender stack.

In addition to these three points of moisture control, the Riegel machine has a moisture-indicating and recording instrument at the reel, as a final check.



TWO CALENDER STACKS (with stainless rolls at water box positions) and reel.

Basis Weight Control

At the final dryer just ahead of the calender stack there is an Accuray instrument for measuring, recording, and controlling the basis weight.

The instrument gives a continuous record (on a chart) of the profile, in the cross machine direction, of the paper running on the machine. The chart is so marked that the machine tender is able to tell which slice adjustment corresponds to any abnormal weight deviation that may be shown on the chart.

The record of the basis weight profile will be made in two places. There is a recording chart at the dry end of the machine, near the testing station, and a duplicate recording chart will be located on the flying bridge at the wet end of the machine at the slice. This record at the wet end of the machine is of special importance because it is close to the point on the machine where adjustments are made to control the basis weight uniformity across the sheet.

In addition to a basis weight profiler across the sheet, the basis weight instrument records the average basis weight of the sheet and automatically controls this average to whatever point desired by adjusting the stuffgate.

Calender Stacks

Two calender stacks are included in this paper machine; application of the materials to the surface to the sheet is made on the first stack. Each calender stack is composed of eight rolls.

The 34-inch king roll, or bottom calender roll weighs 62,000 pounds. The other rolls are 16-inches in diameter and weight 12,000 pounds each. Additional pressure may be obtained to a maximum of 70 pounds per inch of nip length from the pressure cylinder mounted on the top of the stack.

The materials to be applied to the surface are introduced to the water boxes either in combinations of two or four. The Riegel machine will regularly use two water boxes, one on each side of the sheet at the two lowest 16-inch rolls. The boxes are the latest adjustable-end design.

Riegel through experience in its New Jersey plants found that stainless steel rolls practically eliminate the problem of pitting or corroding of the calender rolls where water boxes are used. The calender stack is therefore equipped with two stainless steel rolls for the water box positions. These stainless steel rolls are said to be an exclusive Riegel feature.

All of the 16-inch diameter calender rolls will have a two-inch opening

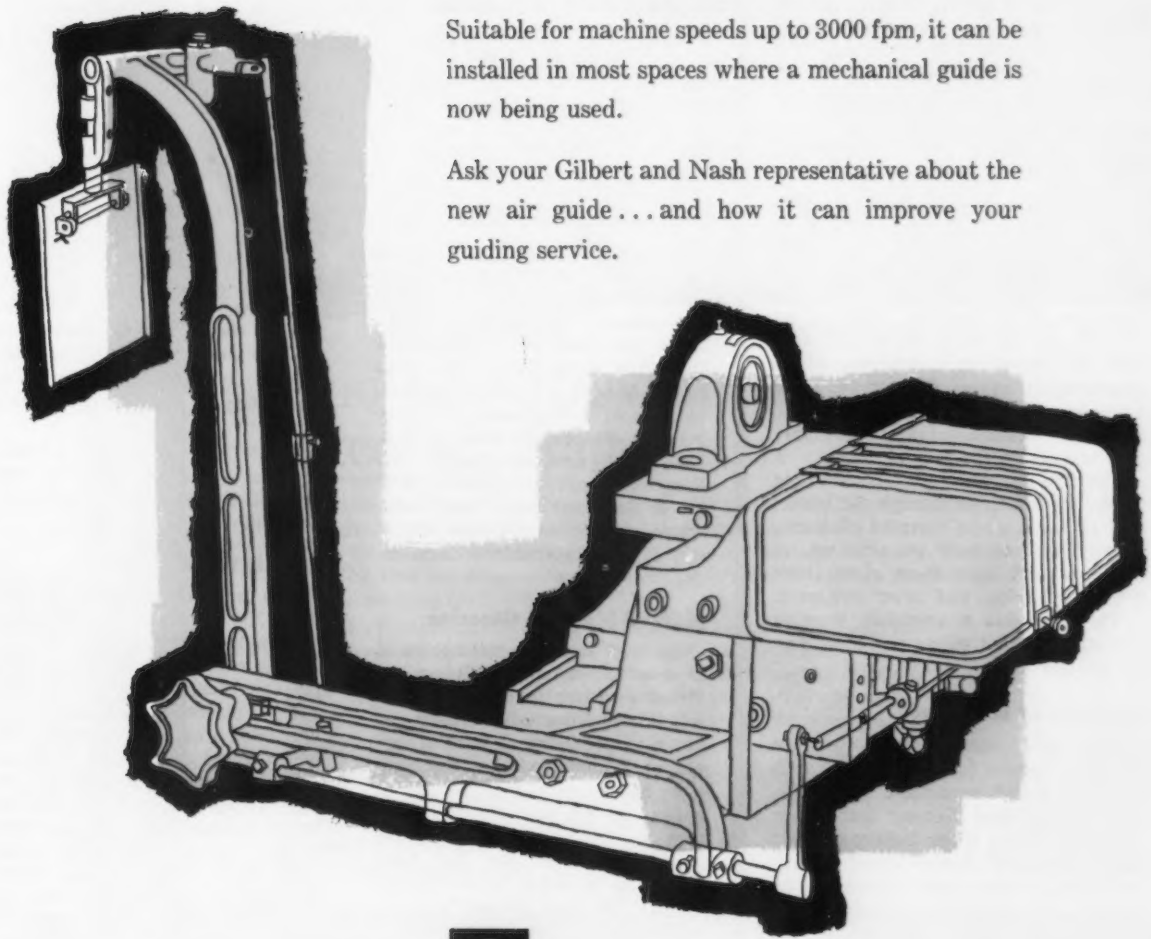
NEW AIR GUIDE FROM GILBERT AND NASH

Here's a new guiding service from Gilbert and Nash —an efficient economical air-operated guide. Simple, too, with a minimum of mechanical moving parts.

The new Gilbert and Nash air guide has a constant rate of correction, regardless of the machine speed. And when correction is needed, there's no lag! The air guide reacts instantaneously!

Suitable for machine speeds up to 3000 fpm, it can be installed in most spaces where a mechanical guide is now being used.

Ask your Gilbert and Nash representative about the new air guide . . . and how it can improve your guiding service.



Manufactured and sold exclusively by

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN

through the center for steam or cold water to heat or cool the rolls as may be required.

The complete machine including the differential drive was supplied by Beloit Iron Works.

Broke Handling

Carolina Belle has two Hydrapulpers for broke and trim. These Hydrapulpers are 17 feet in diameter, one directly below each calender stack. The Hydrapulper under the first calender stack is to collect and repulp the sheet when it breaks down at this point on the machine. When there is a break, the sheet runs down a chute into this Hydrapulper, which is automatically filled with water and turned on. The pulper continuously repulps the sheet and pumps it back to the broke chest.

The Hydrapulper under the second calender stack serves the same function. In addition, this unit receives the trim and any other small amounts of waste resulting from reel changes, etc. The trim from the winder is blown through tubes by means of air to the Hydrapulper.

Roll Finishing

When a set of rolls is finished on the Beloit winder, it is pushed out of the winder onto a conveyor belt. The shaft is held at one end and the conveyor, moving the roll toward the back size of the machine, pulls the set of rolls off the shaft. From this area rolls are placed on a conveyor which automatically moves them through the wrapping area, a roll header, onto a scale, and into a lowerator, which lowers the rolls to the ground floor.

The whole operation of roll finishing from the winder on through the lowerator is done on an elevated platform. This is done to keep the rolls up off the floor and keep them clean, both before wrapping and after wrapping.

There is also a complete sheeting operation so that paper or board may be shipped flat.

Products of Machine

The new machine will produce bleached "special food boards" for such uses as: liquid containers (for milk, etc.); frozen food cartons; bottle caps and seals; butter chips; bakery cartons; bakery boards; frozen food board; spiral wound cans; meat cartons; bacon boards, and other pre-packaging trays and cartons. Other board grades will include folding, bleached liner, tabulating card, manila file folder, etc. The company will also make new printing papers on "Carolina Belle." These will include white vellum, white index, white tag and Manila tag. These will carry the trade name "Carolina."

Riegel's 96 Years

As Told in the Words of John L. Riegel, Chairman of the Board and President

There have been Riegel papers since 1862. In that year, my grandfather, John Leidy Riegel, with five partners, converted an old grist mill in western New Jersey into a paper mill. The original expenditure was $27,000, and the mill turned out a ton of rag news a day. In the next four years Mr. Riegel bought out his partners, moved the paper machine to a more favorable site two miles away on the Delaware River at Riegelsville — our present Riegelsville Mill—and was making a ton a day of jute wrapping paper. This new product was very successful, and the business of John L. Riegel & Son prospered.

My grandfather, by the way, was an enterprising man in many fields. He married four times—raised eleven children — and died at 74, a rich man. No income taxes!

Second and Third Mills

In 1873 John L. Riegel, his eldest son, and three others each invested one-fifth in what is our present company and built a two-machine jute mill at Warren Glen, four miles from Riegelsville. This company built a second mill nearby in 1890 at Hughesville, half way between Riegelsville and Warren. Later, the company bought the Riegelsville mill from John L. Riegel & Son; and these three mills, which we call our "Upper Mills," still form a profitable division today.

Milford Mill and Glassine

In 1907, it was decided to build a new two-machine mill on the Delaware River at Milford, seven miles from Riegelsville. After two years of productng jute and rope papers, it appeared that the company needed another major line of paper and that new German products, glassine and greaseproof, had great possibilities for the food packaging industry in the United States. The food industry was just beginning its momentous advance from the cracker barrel to the package. Necessary additional machinery and technical personnel were brought over from Germany, and the production of one paper machine was shifted to glassine, which remains today our principal paper product. Today at Milford there are seven fourdrinier paper machines operating on glassine and greaseproof papers and an eighth Yankee machine, purchased in 1956 from Scott Paper Co., producing other base papers for food packaging.

Entered Converting

In 1926, with the purchase of the New Jersey Wax Paper Corp., the company entered the field of conversion of glassine and other food wrapping papers at Milford. At first, this was only waxing and printing. Over the years we have added laminating, lacquer coating, extruding with polyethylene, and combining with foil and various films.

Starting in South

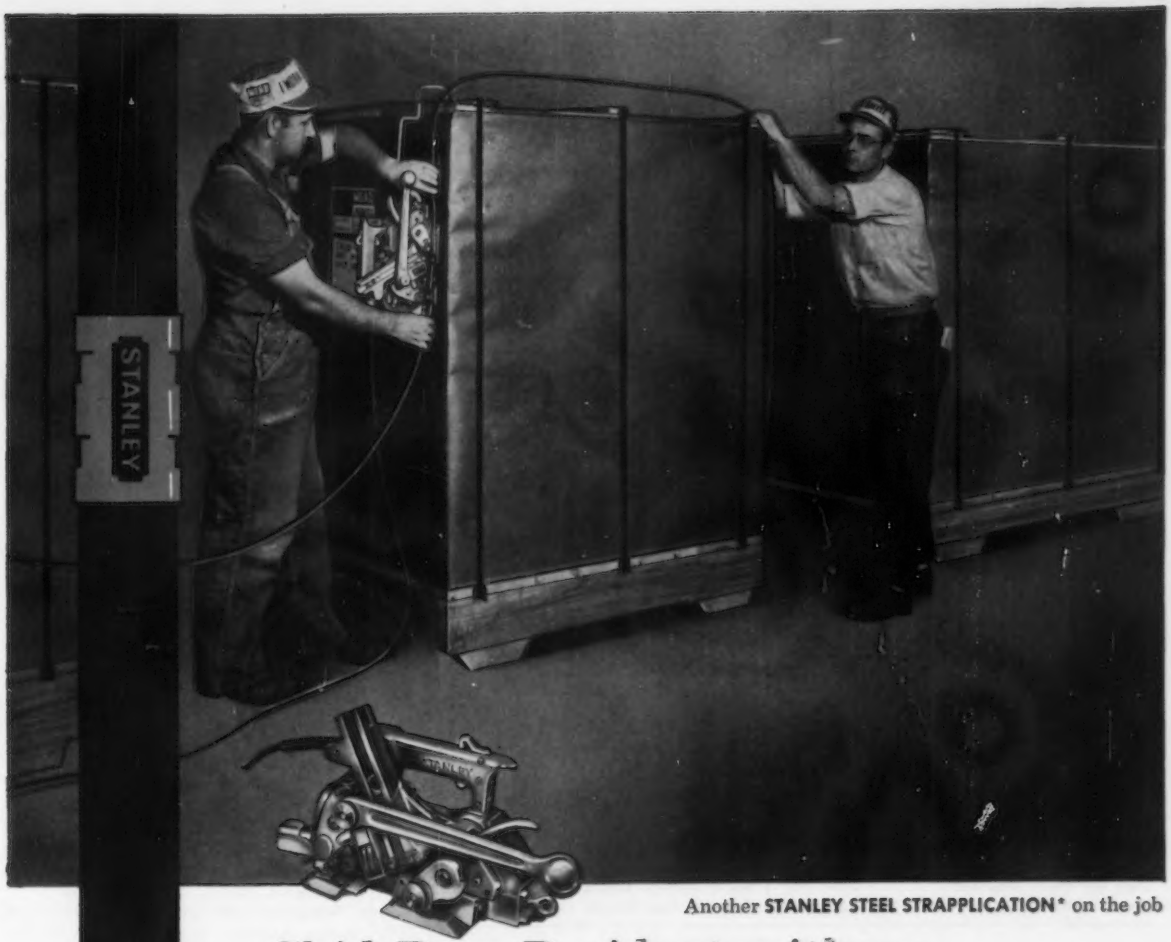
Perhaps the most important single development since the founding of the company was the building of our pulp mill in North Carolina on the Cape Fear River, 25 miles west of Wilmington. During the '30's, we reached the position where we were perhaps the largest purchaser of paper pulp controlling no part of its woodpulp needs.

In 1937, we purchased 138,000 acres of woodlands, together with the mill site of our present Carolina mill.

How It Grew

The mill was designed to produce 200 tons a day of bleached kraft pulp from pine or hardwood. It was our aim to produce from pine an exceptionally strong, high quality bleached pulp, and from hardwood a moderately strong pulp which would give paper a finer surface for printing or coating. As experienced paper makers, we believed that we could be good pulp makers and that we could design pulps to suit other paper mills. This has worked out well; and our pulps have found a good market in paper mills not only in this country but in Europe.

We kept expanding Carolina's capacity, until we decided to increase it by another 50 tons per day, to 500 tons, and to install the paper machine.

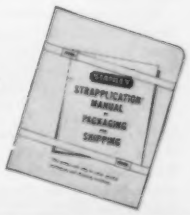


Another **STANLEY STEEL STRAPPLICATION*** on the job

Skid Row Resident with an Excellent Reputation

More and more, wherever there are rows of skids to which paper has been steel strapped you'll find the Stanley Electric Skid Magazine Tool in the picture. There's good reason for the growing reputation of this tool in the paper industry. Time and time again, the ESM Tool has demonstrated its ability to pare hours from packaging time and dollars from handling costs.

Used in a horizontal or vertical position on skid or pallet-load, the ESM Tool electrically power-tightens steel strapping easily and quickly to a **uniform**, pre-set tension. Pull is equal on **every** band. Then, Stanley Steel Strapping provides the great reinforcement strength that assures maximum protection for skid or pallet-load from packaging area to customer.



WRITE FOR YOUR FREE COPY of the "Stanley Strapplication Manual of Packaging and Shipping" to receive complete information on the Stanley Steel Strapping System, Tools and Equipment.
STANLEY STEEL STRAPPING, Division of The Stanley Works, Dept. F, 1307 Corbin Ave., New Britain, Connecticut.

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AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping—made in 24 plants in the United States, Canada, England and Germany.

PRICES OF FIBERS

MARKET WOOD PULP

SECOND QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	‡$90.00/ —	‡$90.00/ —	‡$90.00/ —
Bleached Gw'd.	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	$157.00/162.50*		$157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		$137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

‡ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

PRICES NOMINAL

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.50
No. 1 Unblchd. Muslins	16.00/ 17.00
Blchd. & Unblchd. Underwears	15.00/ 16.00
No. 1 Light Cream Silesias	12.00/ 13.00
No. 1 Light Blue Overalls	7.00/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.75/ 6.75
Cottonades	3.00/ 3.50
No. 1 Washables	2.50/ 3.25

Old Domestic Cotton Rags

Delivered Mill Basis

	Per 100 lbs.
Mixed White	$3.25/$3.75
Cotton Pants & Overalls	2.25/ 2.75
Twos and Blues, Repacked	2.00/ 2.50
No. 2 Roofing	.60/ .75

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended June 6		Per 100 lbs.
Grade 1	n. a.	
2		
3		$9.50/ $8.00
4		7.50/ 7.00
5	1 cut—felting	6.50/ 6.00
6		5.50/ 5.00
7		5.00/ 4.50

*Based on 73% cellulose.

OLD ROPE & BAGGING

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$4.50/$5.50
Scrap Burlap	3.50/ 4.25
Australian Wool Pouches	5.00/ 5.50
Gunny	4.50/ 5.00
No. 1 Domestic Manila Rope	6.25/ 7.50
No. 1 Foreign Manila Rope	5.25/ 6.25
Domestic Sisal Strings	4.00/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	June 9	June 9	June 9	June 9
No. 1 Mixed Paper	$5.00/ $7.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	11.00/ 12.00	12.00/ —	14.00/ —	14.00/ —
Overissue News (Lg. size)	11.00/ 14.00	11.00/ 13.00	19.00/ —	18.00/ —
Mill Wrappers	10.00/ 13.00	10.00/ 12.00	7.00/ —	13.00/ —
Old Corrugated Containers	21.00/ 22.00	20.50/ 21.00	19.00/ —	20.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 45.00	35.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	25.00/ 30.00	30.00/ 32.50	35.00/ —	30.00/ —
(Semi-chem. medium)	40.00/ 45.00	37.50/ 45.00	40.00/ 45.00	30.00/ 35.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	50.00/ —	45.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	50.00/ —	50.00/ 55.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	55.00/ 60.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	60.00/ —	55.00/ 60.00
No. 1 Groundwood Shvs.	21.00/ 25.00	20.00/ 25.00	14.00/ —	30.00/ 35.00
White Newsblanks	42.50/ 50.00	45.00/ 53.00	35.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	55.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	65.00/ —	— / —
Hd. White Shvs.	85.00/ 95.00	95.00/105.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	105.00/110.00	110.00/115.00	90.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 55.00	55.00/ 60.00	47.50/ —	32.50/ —
Manila Tab. Cards	65.00/ 70.00	70.00/ 75.00	65.00/ —	70.00/ —
No. 1 Col. Ledger	28.00/ 30.00	30.00/ 35.00	40.00/ —	22.00/ —
White Ledger	42.50/ 50.00	45.00/ 50.00	52.50/ —	45.00/ —
Mixed Book & Mag.†	15.00/ 18.00	17.00/ 19.00	12.00/ —	— / —
No. 1 Books‡	19.00/ 23.00	20.00/ 22.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:
coml. bulk, c.l. wks. ....cwt. $2.00 / —
iron-free, c.l. wks. .....cwt. 3.55 / —

Casein, acid prec.:
dom. sh. pt. c.l. (30 mesh) cwt. 56.00 / —
Arg. ex dock .....cwt. 19.00 /19.50
New Zealand .....cwt. 23.50 /24.00

Caustic soda:
c.l. wks. solid, 76% .....cwt. 4.80 / —
flak. & grd. drums, c.l....cwt. 5.20 / —
liquid 50% tanks.... 2.90 / —
liquid 73% tanks.... 3.00 / —

China Clay
dom., drv-grd., airfloat:
325 mesh bgs., c.l. Geo. ton 10.00 /12.00
300 mesh, bgs., c.l. Geo. ton 13.50 /14.50
imp., white, lump, c.l. ex. dock 20.00 /35.00

Chlorine:
single-unit tanks, works ..cwt. 3.15 / —
multiple unit, 2-5 cars per yr. 5.75 / 4.05

Lime:
hydrated, bulk, c.l. N.Y. ..ton 23.55 / —
quicklime, bulk, c.l. N.Y. ton 20.55 / —

Gum rosin:
K. M, N, drums, c.l. Savan, cwt. 7.75 / 7.85

Rosin size:
70%, gum & pale paste, tank
cars, south, sh. pt. .....cwt. 7.51 / —

Saltcake:
dom. bulk, 100% anh. wks. ton 28.00 / —

Soda ash:
light, 58% ash bags, wks. cwt. 1.85 / —
bulk, c.l. wks. .....cwt. 1.55 / —

Sodium chlorate:
drums, c.l., wks. .....cwt. 9.00 / —
drums, l.c.l., wks. .....cwt. 9.50 /10.50

Sodium peroxide:
dms., c.l. E. of Miss. .....lb. .20½/ —
l.c.l. (same basis) ..... .21 / .21½

Sodium silicate, 40° Be.:
tank-cars, wks. .....cwt. 1.20 / —
drums, c.l. wks. .....cwt. 1.55 / —
47° Be. WW.
tank-cars, c.l. wks. .....cwt. 1.90 / —
drums, c.l. wks. .....cwt. 2.25 / —

Soybean, protein:
chem. isol., wks. c.l. bags ..lb. .19 / .23

Starches:
Corn, multiwalls, c.l. prod. plant:
pearl .....cwt. 6.49 / 6.75
white, dextrins .....cwt. 8.08 / 8.20
chlorinated .....cwt. 8.25 / 8.35
potato, Idaho, c.l. wks. cwt. 6.35 / —
East, fr. all. 50 cents cwt.
potato, Maine, f.o.b. wks. cwt. 6.25 / —

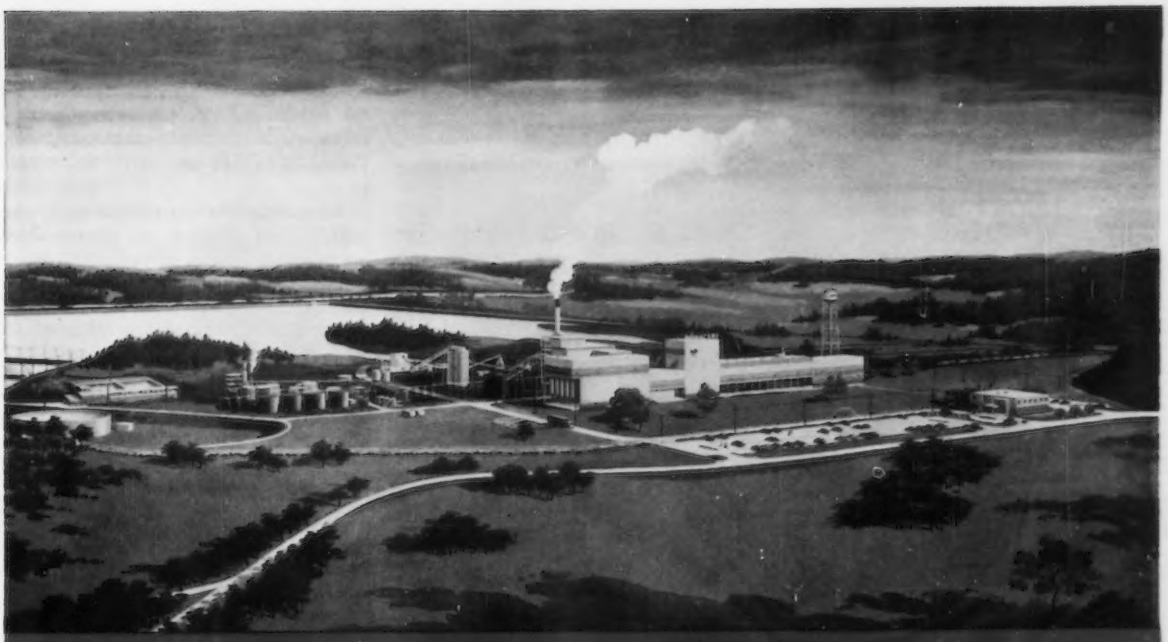
Sulphuric acid:
60° Be. cbys. c.l. wks. ....cwt. 2.00 / —
l.c.l. wks. .....cwt. 2.30 / —
tank-cars, wks. .....ton 18.00 / —

Sulphur:
crude, c.l. mines, contract,
long ton 23.50 / —
f.o.b. vessels Gulf dock...ton 25.00 / —

Sulphur dioxide:
liquid, coml. cyl., wks. ...lb. .10 / .12
multi-unit cars, wks. .....lb. .0535/ —

Talc, fibrous grd., bags:
c.l. wks., N.Y. .....ton 28.00 / —
l.c.l. wks., N.Y. .....ton 31.00 /36.00

Titanium dioxide:
anstase, c.l. dlvd. E. bags..lb. .25½/ —
l.c.l. dlvd. .....lb. .26½/ —
rutile, c.l. dlvd. .....lb. .27½/ —
l.c.l. dlvd. .....lb. .28½/ —



Facilities of New Bowaters Carolina Corporation's Catawba, S.C. Pulp Mill include (left to right): Water Filtration Installation, Caustic Plant, Wood Preparation Facilities, Digesters, Brown Stock Washers, Bleach Plant, Pulp Dryer Building and Shipping Dept.

NEW BOWATERS CAROLINA CORP. MILL TO UTILIZE 75 "BUFFALO" PUMPS

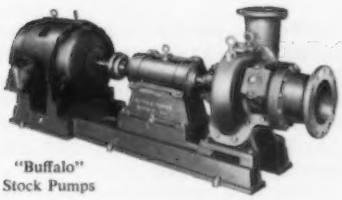
An order of this size from Bowaters Carolina Corporation reflects the confidence of many major paper producers in the performance of "Buffalo" Pumps.

Over half of the 75 units are "Buffalo" Stock Pumps. These will be used to handle stock, black liquor and white water. A quantity of "Buffalo" Double Suction Pumps will be used for general services, including mill water service, fire protection and white water. "Buffalo" Single Suction Pumps, furnished in 316 stainless steel, will handle chemicals.

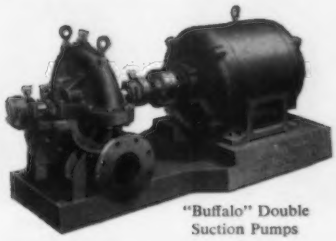
Whatever *your* type or size of plant . . . whatever *your* liquid-moving problems . . . you, too, can place complete confidence in "Buffalo" Pumps to perform with the utmost efficiency, dependability and long-lived economy. For full details, contact your nearby "Buffalo" Engineering Representative — or write us direct, outlining your problems.

Every "Buffalo" Pump brings you the famous "Q" Factor — the built-in QUALITY which provides trouble-free satisfaction and long life.

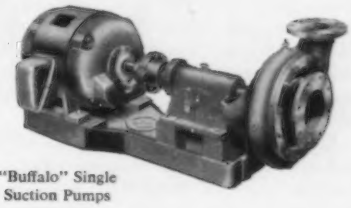
BIG BOWATERS INSTALLATION INCLUDES:



"Buffalo" Stock Pumps



"Buffalo" Double Suction Pumps



"Buffalo" Single Suction Pumps

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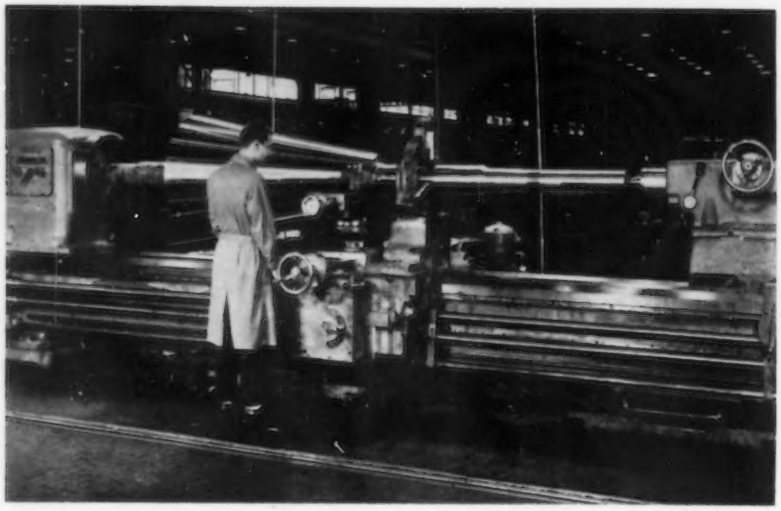


New Heavy-Duty Engine Lathe . . .

. . . has been installed at the Emerson Manufacturing Division of John W. Bolton & Sons Inc. Size and accessories of the Monarch Lathe, make possible turning assembled shafts and plugs in one setting, with all part diameters concentric.

E. S. French
Volatile
Inhibitor Assn.

A. DePhillips
Diamond
Alkali

Volatile Inhibitor Manufacturers Assn. elected E. S. (Ted) French as president. Mr. French, who is industrial packaging manager of the Orchard Paper Co. of St. Louis, will be assisted by the following newly elected officers:

E. D. Cookson, vice president (sales manager, Packaging Papers Div. of Ludlow Papers), Fred Hutchins, vice president (sales manager, Marvellum Co.,) Samuel T. Lawton Jr., secretary treasurer (attorney).

Mr. George Bryant of Ludlow Papers, Inc. was designated to replace Malcolm Odell as a member of the Government Specifications Committee. The next meeting of the Association was set for Wednesday, following the September meeting of the NPTA to be held at the Chicago Golf Club, Wheaton, Ill. In addition to member company representatives, technical personnel of the member companies and the related companies were asked to attend.

Diamond Alkali Co. has appointed Anthony DePhillips assistant branch manager of its Philadelphia branch sales office. He succeeds the late George J. Soren.

E. M. Roth
Becco

L. R. Kent
Bailey Meter

Becco has named Edward M. Roth Jr. manager of the Upper New York sales territory of its Chemical Division, Food Machinery and Chemical Corp., Buffalo, N. Y. Mr. Roth's headquarters will be at Becco's main plant, on Sawyer Avenue, Towanda, N. Y.

Bailey Meter Co. has appointed L. R. Kent resident engineer in charge of the Richmond, Va. office. Mr. Kent is also resident engineer in charge of the Baltimore, Md. office—both offices being subdivisions of the company's Philadelphia district.

Johns-Manville has completed the installation of a battery of ultra-modern automatic machines of various types especially designed to mass produce a variety of Teflon products.

The J-M Chempac line of products will include moulded and machined parts, Chempac tape, sheet, sheet and cut gaskets, extruded rods and tubes and moulded rods and tubes made of Teflon, as well as Asbestos-Teflon packings and gaskets.

Appleton Machine Co. has opened a new Chicago sales office and show room under William Boas, recently a consultant to the packaging industry, who will represent the company in the Chicago area.

Lewis-Shepard Products Inc., Watertown, Mass., has appointed James E. Whitehead as exclusive sales and service representative in Alabama, Northwest Florida and Southeast Mississippi.

Chemical Corp.'s Chemical Divisions have announced the appointment of William A. Kebba as manager of planning and control for the Inorganic Chemicals Department, and Robert H. Malott as manager of planning and control for the Organic Chemicals Department. Both positions have been newly created as part of the current reorganization of the Chemical Divisions.

Appleton Machine Co. has appointed Frank C. Arnold as northeastern representative for the firm. He was formerly associated with Pusey and Jones Corp. as a sales engineer.

CIBA Co. Inc.'s president, Dr. Harry B. Marshall, has categorically denied the charges made in the complaint in the civil anti-trust action which has been filed in the United States District Court, Southern District of New York, against the company.

CIBA is a co-defendant in the anti-trust action together with Geigy Chemical Corp., Sandoz, Inc. and Toms River-Cincinnati Chemical Corp. CIBA, Geigy and Sandoz are the United States dye sales subsidiaries of three Swiss chemical firms, CIBA Limited, J. R. Geigy S. A. and Sandoz Ltd. Toms River-Cincinnati Chemical Corp. is a dye manufacturing firm beneficially owned by the three Swiss companies.

Alllis-Chalmers has assigned Kenneth G. Harley to the steam design section of its steam turbine department as an assistant engineer. A mechanical engineering graduate of the University of Rhode Island, he recently completed Allis-Chalmers training course for graduate engineers.

J. F. Murphy
Dewey & Almy

Dewey and Almy Chemical Co. Division of W. R. Grace Co., Cambridge, Mass. has appointed James F. Murphy Jr. as project manager for its new $4,000,000 Owensboro, Ky. plant.

Parsons & Whittemore Graphic Corp. has been appointed exclusive distributor in the United States for the Gartemann & Hollman line of bag-making machines and flexographic presses. The line includes machines for making flat, square, automatic, satchel and heavy-duty multiwall bags as well as stock-type and simple impression cylinder flexographic presses.

Appleton Woolen Mills held a three-day national sales conference in Chicago, May 25-27. Theme of the meeting was papermakers' felt application and usage. The firm's new advertising and promotion program was also explained to the sales force.

Hercules Powder Co. has made the following appointments in its Rubber Chemicals Division of its paper makers chemical department: Robert W. Little, assistant sales manager with headquarters in Wilmington; David I. Johnston, manager of the department's Akron sales office: Robert W. Turner, sales representative, Akron office.

Graver Tank & Mfg. Co., East Chicago, Ind., 101-year-old supplier of steel fabrications to industry, has appointed W. Clark Root to the position of president and chief executive officer. Jalmer E. Swason, current president of Graver, has moved to the post of vice-chairman of the board.

A. E. Staley Manufacturing Co. has promoted Ray E. Kilty, manager of its Boston branch to head the company's paper industry sales in the entire eastern region.

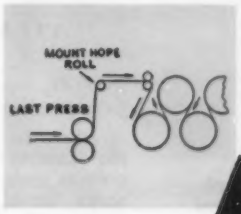
Mr. Kilty, who is taking over a newly created position, will continue to headquarter in Boston.

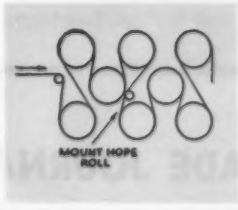
PICTURE OF A MILL STRETCHING ITS PROFITS . . .

by STRETCHING-the-SHEET with

MOUNT HOPE ROLLS

3 TYPICAL INSTALLATIONS





Yes, many mills are actually increasing sheet width in the drying sections by 1 inch or more, through the use of MOUNT HOPE VARI-BOW ROLLS! These highly versatile bow-shaped rolls are installed wherever their positive, automatic stretching action is needed most. They can then be quickly and easily adjusted to varying stock consistencies and web requirements. Get full details on this simple, positive way to stretch the sheet . . . the practical way to improve your operating economy. A MOUNT HOPE Engineer will "show you how". Simply fill out and mail coupon below.

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Plants at Taunton, Mass. and Charlotte, N.C.

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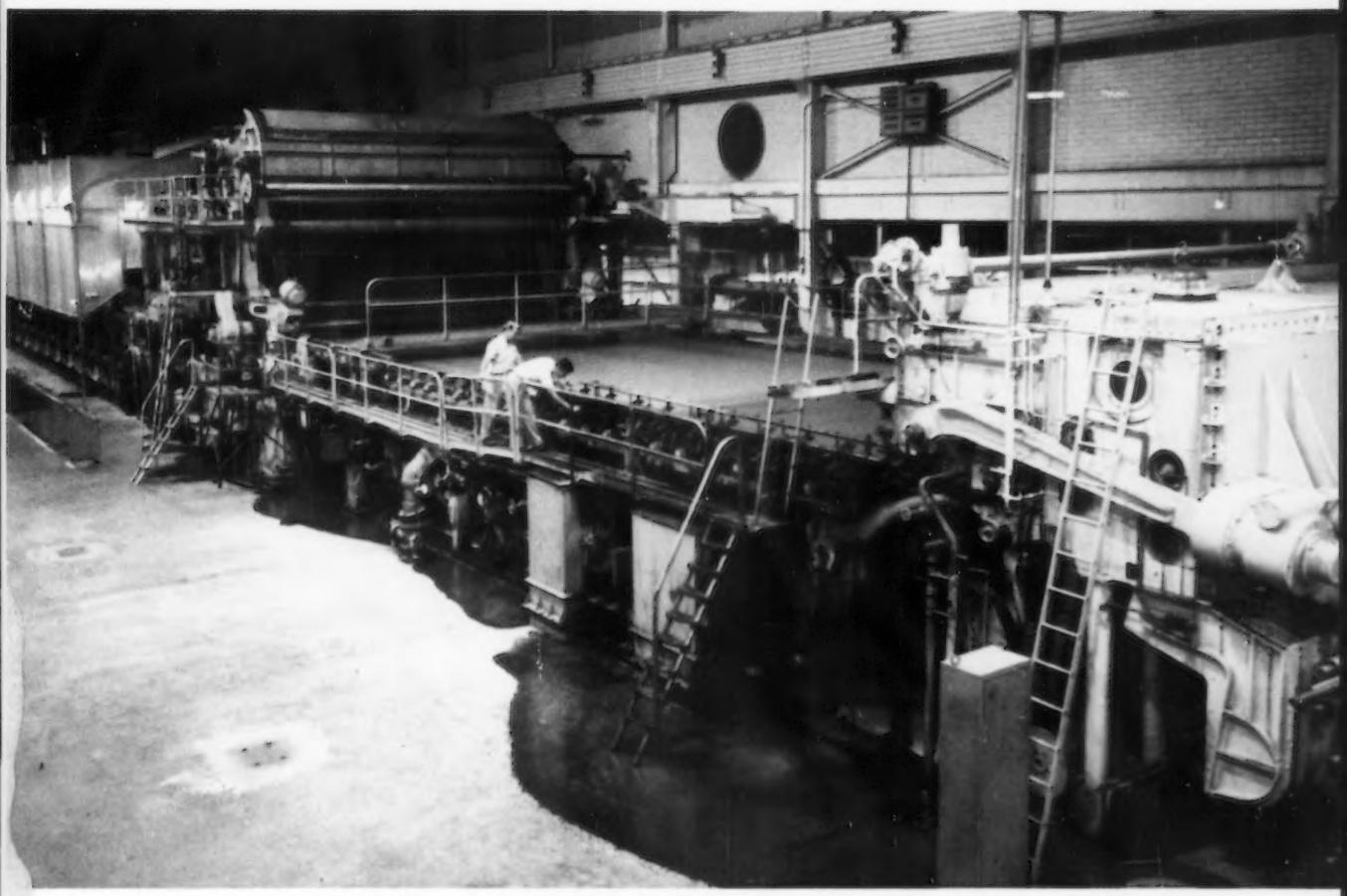

#3 MACHINE, KRAFT DIVISION, CHARLESTON, SOUTH CAROLINA. PHOTO BY J. W. MILLER

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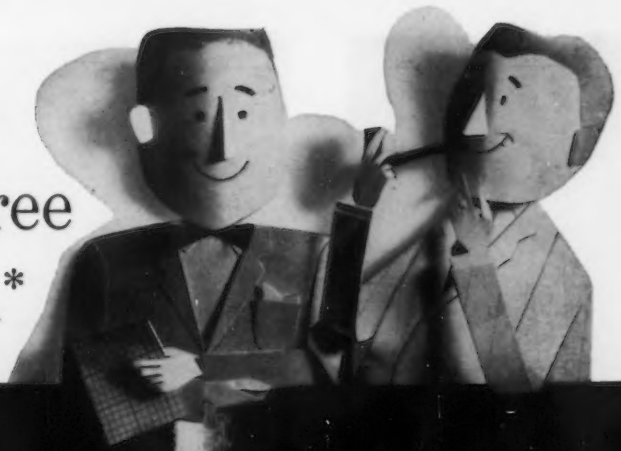
Westvaco's dramatic new extensible Kraftsman Clupak paper is produced on this modern high-speed 264" Beloit Kraft Paper Machine. A Westvaco first, versatile Clupak paper opens new horizons to the paper industry.—"*Your partner in papermaking,*" *Beloit Iron Works, Beloit, Wisconsin.*

paper men uniformly agree on TRONA*



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Prominent speakers at . . .

Canadian Technical Section Meeting

Nuclear power for pulp and paper mills, noise abatement, and quality control were features of the opening sessions of the summer conference of the Technical Section of the Canadian Pulp and Paper Assn. in the Chateau Frontenac held June 2, 3 and 4.

Some 400 technical and research people from pulp and paper mills in Canada, the United States, and Europe, were present for the three-day meeting which was followed by visits to the many pulp and paper mills in the area.

Chairman of the section is Dr. R. D. Duncan, assistant mill manager, Canadian International Paper Co., Three Rivers, Quebec.

Pulp and paper people are thinking in terms of nuclear power to produce their steam requirements. Economies that could arise from the use of nuclear power were explained by R. L. Beck, Canadian General Electric Co., Peterborough, Ontario.

The use of noise abatement devices on high-speed paper machines was discussed at length. The new technique, which materially reduces the manufacturing noise level, is the result of a joint research project sponsored by the Technical Section and conducted by G. J. Thiessen of the National Research Council who participated in the discussion.

K. C. Logan (right) director of research, Anglo Canadian Pulp & Paper Mills, and L. N. Stanners, (second from left) assistant sulphite supt., discuss the program for the summer meeting with Dr. R. D. Duncan (left), chairman of the Section, and Douglas Jones, (second from right) executive-secretary.

Others presenting reports on use of the new equipment were G. J. Lyon, Abitibi Power and Paper Co. Borge Wahlstrom, Anglo Paper Products; George Burkhard, Quebec North Shore Paper Co., and J. M. Truscott, Spruce Falls Power and Paper Co.

Improvements in mechanical pulping procedures were discussed. W. W. Barrett, Canadian Carborundum Co., Niagara Falls, Ontario, outlined the development of new grind stone abrasives. R. M. Sternberger, Halifax Power and Pulp Co., Sheet Harbour, N. S., and C. D. McCulloch, Consolidated Paper Corp., Port Alfred, Quebec, presented papers on pulp cleaning with the Vorject.

Recent studies of the physical nature of paper drying were discussed by H. Preston-Thomas of the National Research Council, Ottawa.

Papers dealing with newsprint manufacture were presented by J. Truscott, Spruce Falls Power and Paper Co. and S. Lukianovitch, Abitibi Power and Paper Co. Fire prevention and suppression in newsprint mills was discussed by K. W. Jamieson of the Canadian Underwriters Assn.

Fundamental research was the subject of a second session. Research reports were given by J. K. N. Jones of Queen's University, Kingston, Ontario; C. B. Purves, McGill University; and T. S. McNight and D. A. I. Goring of the Pulp and Paper Research Institute of Canada.

W. E. Soles, president of Anglo-Canadian Pulp and Paper Mills Ltd. was the guest speaker at the banquet dinner at which G. H. Tomlinson was awarded an honorary life membership in the Technical Section.

Principal Papers Presented at Meeting

Recent Studies of Paper Drying by H. Preston-Thomas, National Research Council.

Practical Application of Noise Abating Devices to Newsprint Machines. Panel Discussion. Panel Moderator—G. D. Hughson, Industrial Cellulose Research Ltd. Panel Members—G. M. Lyon, Abitibi Power & Paper Co. Ltd.; Borje Wahlstrom, Anglo Paper Products Ltd.; G. J. Thiessen, National Research Council; George Burkhard, Quebec North Shore Paper Co.; J. M. Truscott, Spruce Falls Power & Paper Co. Ltd.

Cleaning Groundwood with Vorjects by R. M. Sternberger, Halifax Power & Pulp Co. Ltd. and by C. D. McCulloch, Consolidated Paper Corp. Ltd.

Development of Abrasives for Pulp Grinding by W. W. Barrett, Canadian Carborundum Co. Ltd.

Economics of Nuclear Reactors for Process Steam and Power in the Pulp and Paper Industry by R. L. Beck, Canadian General Electric Co.

Interim Report and Discussion of Centrifugal Cleaning Survey. Panel Moderator—L. M. Morgan, St. Lawrence Corp. Ltd.

Selection of Medium Voltage Switchgear by R. V. Kovacs, Electrical Engineering Consultant.

Applications of Cowan Screens to Cleaning Sulphite, Groundwood and Kraft Pulps by S. W. Hooper, S. W. Hooper & Co. Ltd.

Dirt Studies of Sulphite Pulps by J. Chollet, M. Duffy and O. Sepall, Anglo Paper Products Ltd.

Factors Affecting the Life of Circulating Pump Packings and Shafts. Discussion led off by L. N. Stanners, Anglo Canadian Pulp & Paper Mills, Ltd.

Anodic Protection of Alkaline Pulping Digesters by W. A. Mueller, Pulp and Paper Research Institute of Canada.

Carbohydrate Chemistry at Queen's University by J. K. N. Jones, Queen's University.

Oxidation of Spruce Periodate Lignin with Alkaline Hypochlorite by C. P. Purves, McGill University.

The Sorption of Vapours by Lignin by T. S. McKnight and S. G. Mason, Pulp and Paper Research Institute of Canada.

Some Physico-Chemical Studies of Lignin Sulphonates by D. A. I. Goring, Pulp and Paper Research Institute of Canada.

Action of Dimethyl Sulphoxide on Wood and Sulphite Pulps by S. Hossain, Abitibi Power and Paper Co. Ltd.

Behavior of Wood and Wood Constituents as Acid-Buffering Systems by O. V. Ingruber, Pulp and Paper Research Institute of Canada.

Fire Risks in Paper Mills—Particularly Machine Rooms — How They Should be Avoided and Overcome by K. W. Jamieson, Canadian Underwriters' Association.

Application of the Bird Centriscreen on Newsprint Furnish by S. Lukianovitch, Abitibi Power & Paper Co. Ltd., and S. Salomon, Bird Machine Co.

Paper Machine Winder Cycles by J. Truscott, Spruce Falls Power & Paper Co. Ltd. and C. E. Meill, Beloit International (Canada) Ltd.

Optical Tooling and its Uses in the Alignment of Paper Machines by A. J. Conley and J. L. Hanold, Keuffel & Esser Co.

Optical Methods Can Improve Paper Machine Installation and Maintenance by D. Tamney and C. G. Cook, Foundation Co. of Canada Ltd.

Alkaline Pulping Spruce — Part II: The Change in Pulp Properties Throughout the Cooking Cycle by W. D. Kerr and J. S. Hart, Pulp and Paper Research Institute of Canada.

Bleaching of Alkaline Hardwood Pulp at Cornwall by J. M. Ferguson and E. A. MacDonald, Howard Smith Paper Mills Ltd.

Three-Stage Bleaching of Kraft Pulp to High Brightness by W. H. Rapson and C. B. Anderson, University of Toronto.

The Effect of Paper Mill Rolls on Paper Quality from a Papermaking Point of View. A press style conference with R. M. Leighton, Stowe-Woodward Inc.

No Time for Complacency

"Labor and management may be watching each other so closely that they are missing the economic sign posts", said W. E. Soles, in his address. He dealt with the current business outlook emphasizing particularly the situation in Canada, in the United States, and in Europe. "Fortunately we have intelligent men on both sides of the fence", Mr. Soles continued. "We must face the economic conditions together and I do not despair of our ability to do the right thing."

"Labor enjoys better leadership," he said, "than it is sometimes credited with. Many unions are led by men of integrity and understanding and the pulp and paper industry is singularly fortunate in the unions with which, for the most part, it deals."

Canada Ahead of U. S.

Commenting on the current recession, Mr. Soles pointed out that in Canada we may be too complacent because the over-all productivity in Canada has declined only about five per cent whereas it is off by fourteen per cent in the U. S. Economic events in the U. S. may yet be reflected in the level of business in Canada. This could arise, he said, particularly as in the United States one school of thought feels that the best way to meet a depression is to ignore it whereas, "others feel that propaganda will wash the recession right out of their hair."

Mr. Soles went on to say that while there were several steps that might be taken to promote recovery, rigidities built into our economic system could delay the generation of forces which tend to shorten the present slump.

Europe Leading

As opposed to the situation on this continent, Mr. Soles pointed out that Western Europe has made great progress, "greater than anything we have experienced in Canada or the United States since the war. European technology sometimes surpasses anything to be found on this continent," he said.

"Our North American efficiencies may not be as great as we thought," and the progress of Western Europe has resulted in a flow of low-cost goods from Europe to America, he said.

Long Outlook Good

On the other hand, Mr. Soles emphasized, North American industry "has had to meet rising costs in a recession that has cut profits severely. The present situation in the industry is such as to present great problems and great opportunities for technical people to benefit their industry and the nation."

In concluding his remarks, Mr. Soles stressed the favorable long-term outlook for pulp and paper and remarked that on this continent "we are facing a population explosion the like of which we have never seen before. It will create more than a proportionate increase in the demand for pulp and paper, the very currency of civilization."

Cost Reduction Theme of Superintendents Convention

The theme was timely—the program well organized.

The American Pulp & Paper Mill Superintendents Assn. this year held its annual convention for the first time in Boston, Mass. This, the 39th Annual Convention, was held from June 3 through June 5 at the Hotel Statler and was well attended by over 600 people. With cost reduction the theme, the superintendents heard eleven papers directly related to cost considerations.

The keynote address, titled "Cost Trends Affect Economy of Pulp and Paper Industry", was given by Robert E. O'Connor, American Paper & Pulp Assn.

Program Is Timely

The program was both timely and well organized—timely, in that the pulp and paper industry is vitally interested in reducing costs during this period of intense competition—well organized, in that the program thoroughly covered the various aspects of the cost picture. Subjects ranged from general cost considerations to more specific topics such as maintenance cost reduction, and instrumentation for cost reduction. Other interesting papers were given concerning pulp, paperboard, fine papers, personnel relations, and linerboard. Among the topics were pitch control, paper and board coating, air pollution, the Stevens Former, hardwood soda pulp and a hot press installation. Panel discussions were held on steam consumption on high speed fourdrinier machines and Robabelts on fourdrinier machines.

The program included an "Industrial Affiliates Recognition" luncheon on Tuesday, a "Wake 'Em Up" breakfast on Wednesday, and a luncheon honoring division chairman, also on Wednesday. Festivities ended Thursday evening with a "Get-Together" party followed by a banquet and dance.

Among those attending were over 120 ladies who enjoyed a historical tour of Boston on Wednesday, and a fashion show on Thursday, in addition to the above mentioned luncheons, banquet, and dance.

In addition to other events on Thursday, visits were scheduled in the afternoon to Crocker Burbank & Co. Assn., Fitchburg, Mass. and Oxford Paper Co., Lawrence, Mass. Convention-goers were also invited to visit a number of the affiliate member firms in the Boston area on Thursday afternoon. These were Stowe-Woodward, Inc., Newton Falls, Mass., makers of rubber covered rolls; Rice Barton Corp., Worcester, Mass., paper machines and auxiliary equipment; Improved Machinery Co., Inc., Nashua, N. H., pulping and stock preparation equipment; Foxboro Co., Foxboro, Mass., industrial controls; Simonds Saw & Steel Co., Fitchburg, Mass., cutting tools; John W. Bolton & Sons, Inc., Lawrence, Mass., pulp and paper mill equipment.

Bolton Award Winners

On Tuesday the winners of the 11th Annual Bolton Award Contest were announced by A. L. Bolton, Jr., treasurer of John W. Bolton & Sons, Inc. The subject of this year's essays was "How I Can Help Relations Between My Company and My Community." The winners of the contest were: first prize—John R. Bentley, Western Kraft Corp.; second prize — Ellen Arnold, Congoleum-Nairn, Inc.; third prize—Warren B. McGranahan, Texon, Inc.

New Officers

Retiring as president of the Superintendents Assn. was A. E. Bachmann,

New President
Howard E. Wehr
Mead Corp.

First Vice President
A. C. McCorry
St. Regis Paper Co.

Second Vice President
Thomas S. Coldewey
St. Joe Paper Co.

Third Vice President
C. Ives Gehring
Sealright-Oswego Falls Corp.

Fourth Vice President
Bemis P. Wood
Strathmore Paper Co.

Fifth Vice President
Glen T. Renegar
Container Corp. of America

president of the Missiquoi Corp. and Fonda Container Corp. New officers of the association are as follows: president—Howard E. Wehr, Mead Corp.; first vice president—A. C. McCorry, St. Regis Paper Co.; second vice president—Thomas S. Coldewey, St. Joe Paper Co.; third vice president—C. Ives Gehring, Sealright-Oswego Falls Corp.; fourth vice president—Bemis P. Wood, Strathmore Paper Co.; fifth vice president — Glen T. Renegar, Container Corp. of America. Continuing as national secretary-treasurer is Harry E. Weston.

New Name for the Association?

The president's message given on Tuesday by A. E. Bachmann, retiring president of the association, was titled "PIMA as an Educational Force". Some excerpts from his speech follow:

PIMA is a new word to the industry. It is an abbreviation of Paper Industry Management Assn., the new name proposed for adoption by the American Pulp and Paper Mill Superintendents' Assn. in its proposed revised constitution. This name has been proposed first in the interests of brevity, but more primarily, in the interest of not appearing to restrict its membership or its activities to the interests of that part of the management group with the specific title of superintendent. In its new name "Management" is used in its broadest sense to embrace in its membership eligibility any member of the entire management group whose interests lie in the direction of learning to better apply composite experience and applied science to yield immediate practical results in production management in its broadest sense.

Retiring President
A. E. Bachmann
Missiquoi Corp. and
Fonda Container Corp.

Newly elected Chairman of the Industrial Affiliates
James E. Smith
Sales Manager of the Albany Felt Co.

The management group in its broadest sense which this association serves then is comprised of at least three distinct groups. (1) The top operating foremen and superintendents, who are charged with the operational responsibilities of control, of quality and production standards, trouble shooting and adaptation improvements. (2) The various types of engineers, mechanical, chemical and power used in a staff production capacity, whose function it is to keep abreast of all the new and existing scientific knowledge that is constantly emerging from our research and development groups, and to sift out from this the phases that can at the time be applied practically to operations. In order to accomplish these functions properly they need the intimate contact with our practical operational group and their methods of practical thinking which the meetings of this association can supply. (3) The production management group, including vice presidents for production or mill managers as well as their staff assistants—the industrial and cost engineers and personnel men. This production management group is charged with the initiation of policies concerning "Dealing-with-People," in addition to the development of control systems and standards.

To sum up, in PIMA we are attempting to provide an educational medium by which our technical men and engineers interested in production can become more practical and hence more useful in trouble shooting, development of controls, quality improvement and cost reduction. Also our aim is to make our practical men more scientific or technical in their thinking and methods so that out of this combination the industry can move more rapidly from an art to a science even if at best an inexact one.

National Secretary-Treas.
Harry E. Weston

The Imperative Need for Cost Reduction

The pulp and paper industry should look with great concern on the selling price and quality of competing products.

H. M. Gray

Vice President in Charge of Operations
Sealright-Oswego Falls Corp.
Fulton, New York

It is a hopeful sign when an association of the importance of the Superintendents Assn. dedicates a program to cost reduction. The reduction of costs in all types of American industry, and in all areas of American life, is an indispensable need if this nation is to avoid the terrible results of runaway inflation.

As an American citizen, I have confidence that our political and military leaders will successfully cope with the enemies of our way of life, both abroad and within our own country, if we have a stable economy as a base for their operations. We cannot have a strong nation, capable of successfully defending itself, however, if we do not have the firmest of economies. That requires that excessive inflation must be avoided.

The possibility of excessive inflation in this country is the most dangerous single force working in and on our national life today. It is the one force most apt to affect adversely the very existence of the American way of life, and the American form of government.

It is without profit to anyone to have management blame inflation on unions, to have the unions blame inflation on management policy; and to have both, in turn, blame government. The basic fact remains that, when all of the underbrush is cut away, the inflationary forces in this country are, in reality, the result of governmental policy.

That policy can only be changed by having sufficient integrity of character to support our elected representatives at all levels so that they may follow such course of action that even in government, costs may be reduced.

This inflationary trend had its origin in the early 1930's with the government policy of spending huge sums of money in an effort to get our nation out of the depth of a very severe depression. That governmental action, at that time, had the approval of an overwhelming majority of the citizens of the United States.

It was followed by the necessary heroic effort to defend our way of life in the Second World War; and, of course, was associated with fantastically high expense. Here again there were very few, if any, sane American citizens who questioned the necessity of fighting and winning that war.

That conflict was followed by the continuing high expense of maintaining the various branches of the armed services. Next, we had the tragic Korean incident which added its share to the monumental burden of cost.

Following the Korean War, it was hoped that our country would enter in a period of tranquility, when its military expenditures could be reduced and some of the national debt paid. This, especially, seemed possible in view of the fact that we were enjoying the greatest peace time prosperity in the history of the world. But we find that it did not work out that way.

On the contrary, prices and costs continued to increase. The government was not able to pay much of the national debt. Rather it was forced to ask Congress to pass legislation increasing the maximum legal limit of debt.

These things are not mentioned in criticism of our nation's leaders. They are mentioned simply to show that inflation is really the result of government action—however necessary that action was at the time of the decision. Certainly, our national leaders should do what they can to raise our economy above the level of that existing in the early 1930's.

Surely, we would impeach our national leaders if they did not give us the necessary direction to win a war. But we have had a period between the Second World War and the Korean incident, and another period after the Korean action, continuing until the present, where it should have been possible for us to lower our costs, to keep our prices down, to maintain a stable cost of living, and to reduce our public debt. These things did not happen. I do not believe that they are going to happen until both the American worker and the American businessman follow a policy in their own areas of activity which will result in lowering costs.

Competition

Another reason it is imperative that costs be reduced is the danger of pricing our production out of favorable competitive position. The pulp and paper industry should look with great concern on the selling price and quality of competing products. The more progressive and enlightened management of the industry is fully aware that lightweight foils, films, plastics, and even improved glass and heavier metals are getting an increasing share of business in the field of packaging. The competition from these materials is increasingly dangerous; because the cost of paper to the consumer is increasing, while that of some of the competing materials has decreased.

Packaging is not the only field supplied by the pulp and paper industry in which there is the possibility of reduced sales because of high paper and paperboard prices. The same result will occur in the printing field, and in other areas, if prices become too high.

What can we do about this?

First, let us appraise our own efforts, and increase our own efficiency in this business of reducing cost by

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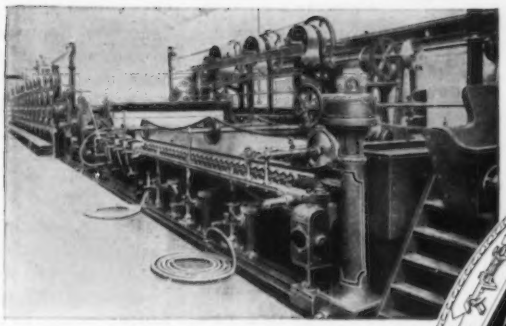

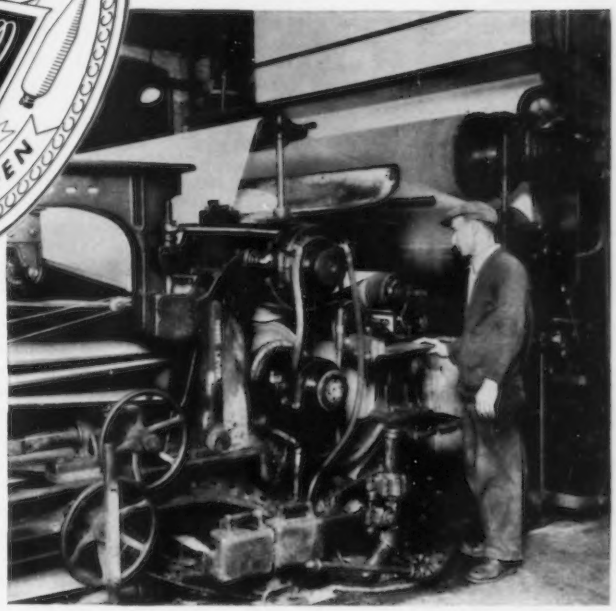

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greatly increasing the amount of favorable effective time which we apply to our work.

Very few people are really very efficient. It is doubtful if any of us are efficient as we could be if we gave thought each day to analyzing our own conduct and our own actions and intelligently and relentlessly directed our actions over the greatest number of hours to produce the greatest favorable results. It is doubtful whether most of us plan each day's work well in advance so that we may know what we are going to do, when we are to do it, and why. If we set examples by establishing high standards of performance, we may be surprised at how contagious the practice can become, and how it can tend to lift the level of efficiency of the people we direct as well as that of our colleagues.

Another thing we can do is to educate ourselves and our fellow workmen at all levels of activity (including the union representatives and company management) of the folly and the dangerous inflationary influence which results from the continuing trend of paying more and more dollars for unworked time. To illustrate: If a company had no vacation policies, no paid holidays, and paid no money for unworked time, it would have a certain labor cost per unit of sales. If that company, in lieu of a wage increase, were to grant six months vacation with pay, it would increase its labor costs per unit 100 per cent. But, it would in no way increase the annual income of the worker. Also, the selling price of the product would of necessity go up.

This, of course, is an exaggerated sample. It was so intended. But in the same way the same situation occurs to some degree everytime a company increases its cost by paying for more and more unworked time. This is always associated with a constantly increasing cost of production.

Destructive Impact

It is a deepening mystery to me to learn, as I go on in life, why there are so many capable executives who do not understand the full destructive impact of this policy. Do not deceive yourself by thinking that I am an individual who does not believe in paid vacations, and in paid holidays, where they can be afforded, and to a degree that they can be absorbed in cost without increasing selling price. I sincerely believe in all of these things—also, insurance and retirement benefits. But there is a limit. We must be careful; or we will set up a scheme of things, which will become too expensive to maintain, and which will fall of its own weight.

Another thing we should not do is to grant an increase in wages which is not justified by an existing or planned corresponding increase in productivity per man-hour. If we do, it will add to the already strong inflationary force.

Eliminate Overtime

Much can be done to reduce cost by the elimination of overtime work. Why is it that we, in management, to some degree, accept overtime penalties as a necessary part of operating expense? We would refuse to purchase a product which increased in cost by 50 per cent as we increased the amount which we purchase from a supplier. Yet that is exactly what we do as we purchase overtime from a worker.

We agree that we will pay a certain stated amount for the first 40 hours of work. Beyond that we are required to pay 50 per cent increase in price for every additional hour that we purchase from the same source in any one week.

We go even further. We agree to pay 100 per cent; and, in some cases, 200 to 300 per cent increase in price if we purchase additional quantities of labor from the same source of supply on certain specified days of the week, or certain days of the year.

I do not know why we do these things in the purchase of labor. We would consider it complete insanity to agree to do this in the purchase of materials. We would readily agree that, in the realm of materials procurement, if we were to be part of such an agreement, we should be considered irresponsible management. Certainly, we can do much to reduce the cost to our industry by the intelligent scheduling of man-hours to eliminate every single cent of the 50 per cent legal fine we pay for exceeding the legal limit for purchasing labor from the same source of supply in any one work week.

One of the largest single cost items in our manufacturing operations is raw materials. Great things can be done in almost any pulp and paper mill to reduce raw materials cost. The possibilities have been amply proved by research and trial. Savings are already being made in a number of places. This applies whether we are using wood, virgin wood fiber, waste, rags, or any other form of papermaking raw materials. Of course, we cannot reduce our costs in this area if we do not believe it possible.

If, however, we stretch our minds, broaden our horizons, improve our knowledge, and increase our courage, we will reduce these costs because we will know that they can be greatly lowered. In our attempt to do this, we have as our inspiration the compelling knowledge that it must be achieved without lowering the quality of the end product if we are to survive in this competitive world.

Costs also can be reduced by the intelligent use of improved techniques and improved mechanisms. The productivity per machine and per man-hour can be increased greatly if we will use our knowledge and install mechanical controls and use automation where practical. Mechanical controls, mechanical inspection, automatic equipment and automation are more reliable than the human element. They are not subject to the fatal factor of fatigue.

Maintenance Costs

If your company is reasonably healthy financially, you are probably over-maintaining your equipment to the amount of many thousands of dollars a year. If your company is not in a too robust financial condition, you are probably under-maintaining your equipment to the point that you are pyramiding your costs by too frequent breakdowns, resulting in great increased labor cost per ton of production plus the loss of income to the corporation for the amount of production which is not made. Perhaps, you are unique, and are not wasting dollars in this area of activity. If you are, I would appreciate it very much if you would introduce yourself to me. I would like to have the privilege of meeting you and of studying your methods. There is much lost time and a great amount of unnecessary expense used in supplies and fittings in this field of industrial activity. It lends itself to waste because, by its very nature, it is difficult to police. Much of it is entirely a matter of judgment.

In my remarks, I have touched on some of the more obvious things which all of us can do to slow down or stop the inflationary trend—to help to keep the costs and selling prices of our industry production competitive. Keep this one point always before you: If we solve this problem and reduce our costs, we will keep our industry healthy and constantly expanding. We will be able to sell our share of merchandise in the market place without justifiable fear of competition from any other product. If we reduce our costs, stop inflation, and keep our national economy sound, the world may come against us; and we will stand. These high objectives require and are worthy of our very best efforts.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.

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Now, these limitations are completely removed. For Kymene 557 is an entirely new type of resin. It contains no urea, no melamine, no formaldehyde. Thus, it will develop its effective wet-strength throughout the entire range of conditions encountered in papermaking. And, it is also a good retention aid for Aquapel® ketene-dimer alkaline sizes.

Kymene 557 is available in drum or tank car quantities from our Savannah, Holyoke, Milwaukee and Portland, Oregon, plants. One trial will show you what you can expect from this new wet-strength resin, under any mill conditions you select. Contact your nearest Hercules PMC representative for more specific details.

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PP58-2

Reducing Costs Through Effective Safety Programming

Ralph V. Metz

Training and Safety Director
Bleached Boards Division
West Virginia Pulp and Paper Co.
Covington, Va.

As we focus our thoughts on the economic and materialistic objective of reducing costs through an effective safety program, we are not unmindful of the humanitarian objective of saving lives and preventing human suffering. Sufficient motivation for an effective safety program is found in the following quotation from some unidentified writer: "And the end is that the workman shall live to enjoy the fruits of his labor; that his mother shall have the comfort of his arm in her age; that his wife shall not be untimely a widow; that his children shall have a father and that the cripples and helpless wrecks who were once strong men shall no longer be a by-product of industry. So, while we consider how to reduce costs through an effective safety program, we are not forgetting the importance of our people, their mothers, their wives and their children.

In the preceding quotation, you will note the reference to by-product — the cripples and wrecks that were once strong men shall no longer be a by-product of industry. A by-product is something produced secondarily or in addition to the main product in manufacture, often an unexpected or unintentioned result. The chief function of a manufacturing enterprise is to make a quality product at a profit. Injuries to people are a by-product produced secondarily, unexpectedly and unintended. They are not necessary and do not add anything beneficial toward our main objective of making a quality product at a profit. In fact they add to our costs and subtract from our profits.

We usually are quite aware of the direct costs of accidental injuries, such as medical care and hospitalization for the injured and compensation for the period of disability. But we usually are not so aware of the magnitude of the indirect costs, such as damaged equipment or product, interruption of production, loss of time of people caring for the injured or just standing by as spectators, the lowering of morale, etc. Careful studies by different agencies indicate that the indirect costs of accidents may amount to as much as four times the direct costs. To understand what that can mean, let us assume a figure of $30,000 per year direct costs for medical care, hospitalization and compensation for injured people. The indirect costs then may run as high as four times that amount, or $120,000. Then if we assume a profit figure of 6 per cent net on sales, approximately the national average, it takes the profit on half a million dollars sales to pay the direct costs. The indirect costs may eat up the profits from sales amounting to two million dollars.

Closely Related

Fortunately, the elimination of the undesired by-product, the maimed people and the reduction of costs, are more closely related than we sometimes think they are. The same kind of things that cause disabled people, cause increased costs. Conversely, an effective accident prevention program that will prevent injuries also will reduce direct and indirect costs.

Safety people become so accustomed to using the words injury and accident interchangeably that most of our investigations and preventive measures are directed toward only personal injury accidents. When one of our people is seriously injured, we go all out to investigate how it happened and take steps to prevent it from happening again. We know, of course, what an injury is — someone is hurt, suffers pain and bodily damage. Unless the injury is self-inflicted or intentionally inflicted by another person, it results from an accident.

The term accident is defined by one authority as a sudden mishap that interrupts an operation or activity. Another authority defines an accident as an unplanned event that interrupts the work or production process. An injury, then, is the result of and is caused by an accident.

Industrial injuries result from accidents. However, we have many accidents that do not cause personal injury. Something went wrong. We had an accident. Fortunately, no one was injured. We say that we were lucky. These accidents — these sudden and unplanned events that luckily do not result in injuries — do add to our costs. Damage to equipment, interruption of the work process, and the time of people repairing the damage are all there as costs.

Here is an example: In loading finished rolls of paper into a box-car for shipment, one roll went through the open door on the side away from the loading platform, broke a section out of the handrail and fell about 15 feet to the roadway. Fortunately no one was injured. It just happened at a time when there was no traffic on the roadway. At shift change time, it could have been a different story. We were lucky. But it was an accident. It wasn't planned that way; and it did add to our costs. There was the cost of sending a lift-truck to recover the roll. There was the cost of repairing the handrail. The roll was damaged and had to be handled as a reject. All together the little incident probably cost about $125.

Prevent the Accidents

To prevent injuries and to reduce costs, we need to prevent, as far as possible, the accidents — those sudden, unplanned events which sometimes result in personal injury and always add to our costs. We need to study and control accidents in much the same way that we study and control the factors that effect production or quality or direct manufacturing costs?

We can orient our thinking to this

Shock loads no problem for Super V-Belts on punch press

Severe shock loads, which caused standard V-belts to fail, were no problem for Gates Super Vulco Ropes on this punch press.

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A Gates exclusive: provides greater flexibility . . . prolongs belt life . . . helps deliver more power to driven machine.

2. Concave Sidewalls (U. S. Pat. 1813698)

Note the concave sides shown in Fig. 1. As belt bends, concave sides become straight, making uniform contact with sheave goove (Fig. 1-A). Even contact means uniform wear . . . far longer belt life.

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Especially designed to handle the heaviest shock loads, Gates Super Vulco Ropes solve tough drive problems — reduce both maintenance and replacement costs.

For example: Mr. Daniel Rusinow, president of the R & D Manufacturing Co., Detroit, Michigan, needed to improve efficiency in a 250-ton punch press. The press was originally driven by flat belts, but these slipped and proved unsatisfactory.

Mr. Rusinow first replaced the flat belt drive with standard V-belts, but the severe shock loads of the punch operation caused the belts to fail.

A superior shock-absorbing drive was needed — the local Gates Field Engineer was consulted, and Super Vulco Ropes recommended for the job.

Mr. Rusinow commented, "After our experience with other V-belts, I did not believe it possible to design such an excellent drive, but Gates engineering service and Super V-Belts proved the right answer to the problem."

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end by adding to our definition of accident the concept that accidents are caused. The occurrence of an accident is not governed by the phase of the moon or by a black cat crossing our path. Accidents are caused by unsafe, hazardous conditions connected with the work or the work area, or by unsafe acts of workers, by the injured himself in many cases, or by a fellow worker in other cases. In some cases, there may be a combination of an unsafe condition and an unsafe act. Our definition of an accident should be enlarged to read, "An accident is an unplanned event caused by an unsafe act or condition or both." Now we have a practical concept that we can put to work. Determine and eliminate or control the causes — and we can eliminate or control the accidents that cause our injuries and add to our costs.

Supervisor's Responsibility

In practice, accident control takes its proper place along with production control, or quality control as an integral part of the line supervisor's responsibilities. Accident causes are acts and conditions connected with the work situation and with job performance. They are the things that often cause personal injury but always interrupt the work process, affect quality and increase costs. Therefore, they are under the observation and control of line supervision. The line supervisor is in the best position to see and correct unsafe acts and conditions within his jurisdiction. He has the opportunity, the authority and the responsibility.

The supervisor closest to the work being done is the key man in an effective accident prevention and cost reduction program. To enable him to handle this responsibility effectively he should be led to see that it is an integral part of his job. He needs to understand how and why accidents affect production, quality and costs; and he needs assistance in learning to see and correct unsafe acts and conditions before they cause accidents.

In this approach to accident control, we do not limit our investigation and study to the accidents that cause serious injuries. We investigate just as thoroughly the accidents that cause minor injuries in which there is no loss of time, and also the accidents that do not result in any injury. By so doing we not only determine the causes of accidents, but we assemble a mass of control data that helps to direct our efforts where they appear to be needed most.

For the identification and classification of accident causes, the American Standards Assn. pamphlet Z16.2-1941, Part 1, is most useful. It lists eight types of unsafe mechanical or physical conditions, namely: unguarded, inadequately guarded, defective condition, hazardous arrangement or procedure, unsafe design or construction, improper illumination, improper ventilation, and unsafe dress or apparel. Nine types of unsafe acts of people are: failure to secure or warn, unsafe speed, making safety devices inoperative, using unsafe equipment, unsafe loading or placing, taking unsafe position or posture, working on moving or dangerous equipment unnecessarily, horseplay and failure to use protective devices.

Each supervisor investigates and reports on each minor and lost time injury suffered by his people. An individual report woud reveal what he determined to be the cause of the injury, according to the A.S.A. list of causes and would state what corrective steps he is taking to prevent a recurrence. The causes are tabulated in a monthly recap, according to departments and causes. Over a period of time, the information is quite revealing to departmental supervision and to management. Some of the facts brought to light by such control data confirm the conclusions of various authorities and agencies. Other revealed facts are pertinent to our local situation and enable us to concentrate our efforts where needed most.

For instance: Our information confirms the conclusion that about 20 per cent of industrial injuries result from causes classified as unsafe conditions, and about 80 per cent result from unsafe acts of people. Obviously then, without relaxing our efforts to spot and correct unsafe conditions, we need to concentrate about four times as much effort toward observing and correcting unsafe acts, unsafe work methods and habits. This is our most fertile field for accident prevention. It also is a fertile field for cost reduction. The most efficient work methods and habits have safety built into them. If the work method or habit produces frequent accidents and injuries it isn't the best and most efficient method.

Also, we find that the frequency of lost time or disabling injuries varies directly with the frequency of minor injuries. H. W. Heinrich, in his book "Industrial Accident Prevention," states that "from data now available concerning the frequency of potential injury accidents, it is estimated that in a group of 330 accidents of the same kind, 300 result in no injuries, 29 in minor injuries and one in a major or lost time injury." We have no practical way to measure all the no-injury accidents, but we do find that our lost time or disabling injuries occur in the ratio of one to each 37 minor injuries. The obvious control approach is to determine and eliminate the causes of the minor injuries. Thus we reduce both the minor and the lost time or disabling injuries. The same things that cause the minor injuries cause the disabling injuries. The difference is largely chance and not controllable. But as we reduce the number of minor injuries, we reduce the disabling injuries and costs.

From the accumulated information, we are able to determine the most frequent specific causes and thus concentrate on controlling them. For example: In one period, the most frequent cause of injury may be the unsafe act classified as "failure to use protective devices." Then we need to exert more effort toward promoting the use of eye protection, safety shoes, respirators, etc.

In another period, the most frequent cause of injury may be "taking unsafe position or posture" — which includes such things as standing under suspended loads, lifting with bent back or in awkward position, riding in unsafe position on vehicles, stealing rides, etc. Here we need to reinstruct in safe lifting and take steps to control the other unsafe acts in this category.

Conclusion

In conclusion, if we are to be successful in our efforts to reduce costs through an effective safety program, we need to have a program that is logical, specific and practical. Such a program recognizes that:

Injuries result from accidents.

Some accidents result in injury—all accidents increase costs.

Accidents are caused by unsafe acts and/or conditions.

Unsafe acts and conditions can be recognized and corrected before they cause accidents.

The supervisor in charge of the work being done is in the best position to recognize and eliminate the causes of accidents. He has the opportunity, authority and responsibility.

The frequency of disabling injuries varies directly with the frequency of minor injuries and with the frequency of no-injury accidents. Consequently, to get the best results, we need to study and control the no-injury accidents as well as those accidents that result in personal injury.

As we diligently search for and eliminate the causes of accidents, we not only reduce our costs but we also reduce the personal injuries, the unwanted and unnecessary by-product of industry.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.

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Non-Financial Incentives of Productivity

Alva F. Kindall
Professor of Business Administration
Graduate School of Business Administration
Harvard University

There is "pay dirt" in the areas of non-financial incentives — perhaps more pay dirt than in many financial incentive areas.

What do I mean by non-financial incentives? They are those incentives provided to each individual in an organization — any organization — as the direct result of effective personnel administration.

You might ask at the outset, "Do you mean to say that financial incentives are of no significance?" I believe everyone of us expects to receive a fair day's pay for a fair day's work. Wages and salaries and financial incentives, of course, do have much significance both in prestige and in providing groceries.

Any organization's wage and salary levels and financial incentive plans must bear an appropriate relationship to those plans provided by other organizations in its area of operation. Internal relationships of rate of pay for various jobs and positions must be in proper alignment. Also, an organization must implement its wage and salary policies by such efficient standard procedures as community and industry wage and salary surveys, appropriate programs of job and position evalution, and periodic studies to determine whether its incentive pay plans are really effective.

Perhaps my premise might better be stated as follows: Given proper wage and salary structures that are in line both with outside competitive levels and with the relative importance of job and position levels within an organization, and given proper financial incentives, an organization, through providing, in addition, proper non-financial incentives can attain almost unlimited increase in productivity. In addition, in most instances, these non-financial incentives are vastly more productive than financial incentives.

I have already said that these non-financial incentives are the direct result of good personnel administration.

What do I mean by good personnel administration? Let us turn to the book "Management and Morale," written by my esteemed colleague, Fritz J. Roethlisberger. He writes: "Many plans and systems of personnel management seem to me to be adequate in general but inadequate in particular. They address themselves to human nature in general but not to human beings in particular. They tend to be concerned with somebody and anybody, but with nobody in particular. My plea, therefore, will be for a personnel program that addresses itself to the concrete human situations in a particular plant."

In addition to the terms customarily used to describe personnel functions, such as employment, placement, training, working conditions, safety and health, hours of work, wage and salary administration, promotion, demotions, transfer, termination, retirement, recreational, social, and fringe benefits, and collective bargaining, Mr. Roethlisberger suggests: " . . . it might be interesting to restate the human problems of a business organization from a different point of view. The new way of classifying human problems which this point of view suggests does not supplant the former. It is merely another way of conceiving of the human problems of a business organization"

Collective Purpose

Roethlisberger continues, " . . . the first human problem of any business organization is how to secure the cooperation of people in attaining its collective purpose."

Roethlisberger thinks we must keep separate: "(1) the processes required to secure the economic purposes of a business organization from (2) the processes required to secure the cooperation of people in attaining these purposes . . . If the first human problem is how to secure collaboration among members of the working force, then some of the subordinate problems relating to it can be roughly divided into three groups: (1) problems relating to channels of communication within the organization through which employees can learn about their duties and obligations in relation to the economic purpose, as well as express their feelings and sentiments about their methods and conditions of work; (2) problems of maintaining a condition of balance within the internal organization such that employees, by contributing their services, are able to satisfy their desires and hence are willing to cooperate; and (3) problems of effecting individual adjustments, whereby particular employees who are having difficulties can be assisted to become better oriented to their situations."

Roethlisberger concludes: " . . . personnel management of a particular business organization is adequate when

1—It introduces in its own organization a skill of diagnosing human situations — not some pious platitudes or 'wheezes' on how to treat employees in general.

2—By means of this skill, it commits itself to the continuous process of studying human situations — both individual and group — within its own organization.

3—It tries to secure the collaboration of its employees by running its human affairs in terms of what it learns and discovers about its own organization.

4—It learns that what is important to particular employees exists in its own back yard — not in university libraries or in the minds of university professors."

Personnel problems cannot be separated from technical problems. They are both parts of a single situation that must be understood and dealt with by all line and staff executives from the president of an organization on down. At the same time, every organization, regardless of size, must have, at least on a part-time basis, a department of personnel administration giving its complete and uninterrupted attention to developing the necessary skills in human relations.

Personnel administration must be represented at the top level in an organization to aid in the development of personnel policies. This department must have sufficient help and a large enough budget to do a good job.

The personnel administrator must be well trained. He must be a person who can help, advise, and caution. He should be a person who is cost minded and who realizes the importance of profit. He should be a person who is not bogged down in details. He should never give orders but instead rely on the power of ideas. He should be a person who can work with and for other executives, letting others take credit for his ideas. He should know

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how to get facts, and to weigh these facts before giving help and advice.

It is very difficult to get facts in human situations. People react differently to the same situation.

The personnel administrator I am talking about is a person who knows that people respond better when they are treated not as we think they ought to feel and act but rather as they *do* feel and act. This person is the one who tries to understand feelings and to get the meanings behind written and oral statements.

A good personnel administrator is one who is concerned with long-term principles rather than short-term results. He knows that personnel policies should be written, understood, be sound in principle and useful in practice. These policies must be developed by the entire management team.

This personnel administrator must also be flexible — willing to change. People and conditions change constantly. To progress, we must change. At the same time, people must understand the reasons for change.

A good administrator is a person who does not want to go it alone in planning and administering his personnel and human relations activities. He realizes that, if his subordinates help him work out solutions, they will be more apt to agree with them. A good administrator will develop subordinates who can reach the point where they come up with solutions on their own. Subordinates of a good administrator will realize that their superior is working for them, not on them. Joint solutions to human problems are the best solutions. Two heads are better than one, unless they are on the same body.

To get into some of the specifics of these problems, I should like to suggest that building and maintaining any organization requires:

1—Attracting into an organization the best help available in order to develop a stable group of intelligent employees.

2—Dignified and effective recruiting. Good personnel relations commence with the initial contact with an applicant. It is a constant concern to me to see how poorly many of our leading firms conduct themselves when recruiting at the Business School.

3—Attractive, modern, efficient employment facilities and methods to attract a suitable number of candidates now and in the future.

4—Employment and placement interviews that provide a two-way exchange of information on the qualifications and potential of the applicant and information about the job and the company.

5—A modern testing program under the supervision of a competent testing expert who conducts himself in accordance with the highest ethics of his profession.

6—A complete medical program to assure you that your workers are capable physically of performing the job you want them to do.

Once having attracted the best applicants available, other steps are necessary:

1—Working with the personnel department, a good administrator will want to develop and execute sound induction and training methods.

2—Jointly, they will develop policies and procedures for transfers, promotions, demotions, layoffs, discharges, and leaves of absence that are fair, equitable, and consistently applied.

3—Seniority alone will not be relied on as the deciding factor in these changes. Merit, too, will be considered.

4—Careful, regular, and periodic appraisals will be made of the performance of every member of an organization. This will enable each individual in an organization to get a periodic answer to his question, "How am I doing?" First, a superior will *tell* his subordinate, honestly, how he (the superior) appraises the subordinate's performance on the job. He will tell him the things he has done well and then the areas in which improvement is necessary. Then, the superior will sit back and *listen* and make this the educational and human relations experience about which Roethlisberger talks. Together they will map out a program for future development and progress. All of this, of course, will take place in privacy.

5—Discipline, preferably self-discipline, will be administered promptly and consistently on the basis of simple rules which are clearly understood by everyone affected. When discharge for cause is called for, the good administrator will want to analyze what went wrong, and what possible management actions or policies might have failed.

6—Good administration calls for watching the score on your human beings. Facts, figures, and statistics will have to be studied and analyzed. Records on absenteeism and tardiness, if properly analyzed, can shed light on problem areas. Labor turnover records, if properly maintained, show who are leaving, why they are leaving, from where they are leaving, what turnover is costing, and what must be done to reduce turnover. Adequate accident data show where accidents are happening, why they are happening, how much accidents are costing, and where effort must be expended to save on this extremely costly item. Grievance data give many insights into the kinds of gripes that are occurring, where they are coming from, the dissatisfactions and frustrations which are disclosed, how many grievances are going to the first, second, and third steps and to arbitration, and what should be done to prevent recurrence.

Accurate records of working hours and overtime reveal the cost involved and show possible effects on morale. Keeping a record of the number of suggestions and new ideas coming up the line will reveal where they are coming from, if there are enough of them, of what quality they are, and what can be done to encourage more good suggestions.

7—The good administrator will want to provide safe and healthful working conditions that appeal to the pride and self-respect of the individual. Best results can be obtained by the joint efforts of the line, the personnel, and the medical executives working together as a team.

8—Good communications up and down and across all levels of the organization must be developed. Managements will want to communicate with employees and will want employees to communicate with them. The good administrator knows that employees want to share in solving problems of management. Good house organs and periodic letters from management can be effective if thoughtfully prepared. But, above everything else, the minute by minute, day by day, contacts between superiors and subordinates must be free and open. The good administrator insists upon having subordinates who feel free to tell him what he should hear, rather than what they think he wants to hear — all without any fear of reprisals.

9—Employees want p r o t e c t i o n against the major hazards of industrial employment, such as sickness and accident benefits, life insurance, hospital and medical benefits, pensions, vacations, and so forth.

10—In the area of executive development, the line organization working together with personnel will want to set up ways and means for selecting and developing capable understudies for every executive position. This is a continuous process. It involves training for the job, for production, for the occupation, and for supervision. I sincerely believe the case method of instruction is truly effective in educating and training subordinates. People don't like to be lectured to or talked down to. The importance of day-to-day coaching on the job cannot be overemphasized. Such a program requires a competent training staff that can provide information and advice on the latest and most

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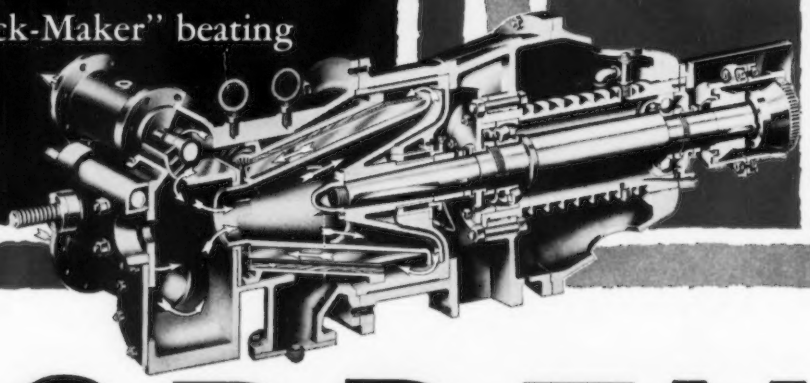

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effective training methods, so that every line executive will be able to assume and carry out his responsibility for training.

11—The importance of proper labor relations must be stressed. We are all entitled to our own opinions with respect to this controversial matter. Unions are here to stay. Labor's fight for recognition is just about over. We will have to develop constructive relations with our unions. The means will vary from company to company.

Continue to Learn

All of these areas of good personnel administration which provide incentives to employees and result in greater productivity depend upon an executive organization which continues to study and to learn. This type of administrator will not be deceived by the flattery of others coming to him for advice and decisions. He will realize this does not make him an authority who no longer needs to read, to study, and to develop himself. He will know that, as he progresses, many things are happening.

He is growing older and gets a little more tired. Social, community, and business obligations increase. Memberships in clubs and organizations become essential. Time is a more important factor.

But the good administrator will continue to read, to attend conferences, to ask others for their opinions and suggestions, to be aware of the opinions and feelings of others — in summary, to go on learning. He will remember that human problems are the most difficult. He will never know all the answers, but he won't be discouraged. He will keep at it.

To sum up what I have been referring to as the non-financial incentives of productivity, the results of good personnel administration, let me review some of these non-financial incentives which I maintain will produce greater productivity — more cost reduction — than most of the financial incentives. Here they are (and here I am indebted to a former boss and friend of mine, Thomas G. Spates, for many of these ideas):

1—A management team which practices high standards of character and morality — a management team that believes in and practices intellectual honesty. This is the type of management which does not condone reciprocal arrangements, bribery, and privilege.

2—A management team that has written and published policies — a bill of rights—the rules of the game.

3—A management team that has high standards of administration—good leadership.

4—A management team that has good organization concepts and sees to it that every individual knows who his boss is, for what he is responsible, and where he can go in the organization to get help to do his own job most effectively.

5—A management team that provides a competent personnel administrator at the top organization level who has attributes of greater significance than just "liking people."

6—A management team that sincerely desires participation by consultation and explanation up and down and across through *all levels* of the organization.

7—A management team that keeps everyone informed on matters affecting their interests.

8—A management team that encourages freedom of expression of points of view and attitudes without fear of reprisals.

9—A management team which provides a work environment which appeals to the pride and self-respect and dignity of the individual.

10—A management team which is sympathetic and considerate of people's trials and tribulations.

11—A management team which provides steady and certainty of employment.

12—A management team which provides promotional opportunity and lets the individual know where he goes from here.

13—A management team which makes available an adequate training program.

14—A management team which gives employees an answer to the question "How am I doing?" by establishing a good program of performance review.

15—A management team that exudes a spirit of friendliness by use of such simple, inexpensive, and undemanding devices as a smile, a cheerful greeting, a nod of recognition, a word of sincere praise, the ability to listen, and the human consideration of the other person's point of view.

So I conclude my presentation by urging you not to rely solely on financial incentives in your search for productivity and cost reduction. Don't get overly enthusiastic with time and motion analysts, with their flow charts and stop watches, productive as they are. But be sure to back up these financial incentive plans with the type of non-financial incentives that I have tried to enumerate today. If you do, you will be pleased with the results.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.

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T. E. Hoover

Production Superintendent
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Business trends are widely quoted to clinch the argument that things are tight:

1—Magazine advertising in April remained nine per cent below 1957 for monthly magazines.

2—Hotel occupancy in the first quarter was 68 per cent, down from 72 per cent in the same period of 1957.

3—Auto production in April fell to the lowest level for the month since 1948. Assemblies decreased to 316,503 cars, down from 357,049 in March.

And so it goes with unemployment figures, industrial production indices, retail sales, and housing starts.

In the present period of inflation, with its vicious circle of higher wages, higher prices, and lower profits, closer control of costs is becoming more important in the successful operation of a business. All indications are that high wages and high prices will be with us for some time to come. Raising prices still further is not the solution to the profit squeeze. One real answer to the profit problem lies in better management, particularly in the area of cost control and productivity.

The problem of correcting poor cost conditions has many sides. You must have a good cost control system, good communications, an organization team to attack the problem and foremen who understand their responsibilities for cost reduction. However, more basic than control systems, good communications and foremen understanding of their cost reduction responsibilities are attitudes and feelings that your crews must have towards productivity and cost reduction.

One may ask, "How do I get these attitudes or feelings across to crews about cost reduction and productivity?"

My answer is: We get it to the crews through our foremen. I picture a foreman standing on two strong and solid legs. One leg is knowledge and skill of the job. The other leg is leadership of his people, getting the work done through people.

Most of our foremen are pretty solid in job "know-how." They have come up through the job progressions and know our processes, equipment and products. Our foremen are leaders, salesmen and promoters in three areas: safety, quality and housekeeping. They aren't born that way — management molded them that way because of the emphasis we place on safety, quality and housekeeping.

Ten years ago I worked on a shift with a foreman, a new one. I remember well the night he got instructions that, during the week, he should speak to each man on an individual basis about the advantages of wearing safety shoes. It was tough work for him. He asked me to go along with him on his first several talks to see how he did. Today, if that foreman cornered you about buying safety shoes, he might sell your entire family. He is personally sold on safety. He talks it sincerely and confidently. He has had training courses on safety. He has attended safety conferences. He has been a member of safety committees. He has led safety committees. He reads about safety; and he hears it from his superintendent and manager.

Our foremen are similarly steeped in quality and housekeeping. Their belief in, and dedication to, quality and safety is in daily evidence to the crews. Individually, and in groups, the crews have had friendly, informal chats with their forman on these subjects. They have attended meetings which he conducted. Frequently they have worked together in contests to win prizes. Less frequently, there has been the reprimand or even disciplinary action taken by the foreman to make his point. Thus, attitudes have developed about safety, quality and housekeeping.

Understand Economics

The foreman, today, needs a similar understanding of basic economics so that he can help create the right climate and atmosphere for productivity gains and cost reduction programs. The unions are becoming active in educating their representatives. Our employees go farther in school, and read more, than the employees of years ago. So it is up to us to help our foremen feel adequate to talk informally and in meetings with their crews on economic subjects.

Our foremen need to have a basic understanding of the American economic system under which:

1—Individual freedom has flourished.

2—Wages, profits, private property, free markets, competition and limited government regulation are realities.

3—And tools and human effort have been combined to attain the highest standard of living known.

They should also be aware of other systems where government ownership or force and tyranny are the rule.

Give the foreman this basic understanding so that he can answer questions with facts stated in his own words.

Here are some typical questions that the foreman will run across:

1—Why does the company want to put a big new high-speed machine here? What will happen to the old machines? What will happen to me?

2—Isn't $4,000,000 a lot of profit?

3—Why is the company trying to eliminate or combine jobs?

4—What's behind this new cost reduction program?

How well management's side is represented in these discussions depends upon your foreman's training and background. If he feels inadequate he won't enter into the discussion at all. With some training and forethought on his part, he can do a very fine job of explaining and answering these questions. Do you remember your first experience in answering the question, "Is there really a Santa Claus?" Or the question: "Daddy, how did the stork bring the baby?" Your answer to either question was probably pretty badly handled unless you had given some thought to it. So it is with our foremen. If they are given some basic economic training and a chance to discuss it with other foremen, they can promote cost reduction and productivity to the crews with the same confidence that they sell safety, quality and good housekeeping.

Basic economic training for foremen is no one-shot or short course deal. We don't have a pat-easy program for training foremen to be safety minded. Foremen safety training is an everyday, continuing thing that becomes a way of life; so it must be with economic training. First of all, the boss must be sold. He must discuss it at every opportunity — in his foremen's meetings and in his everyday chats with them. In addition there are:

1—Films. There are many excellent films which vividly portray some eco-

One in a series of interviews with the men who are "Virginia"

"The paper manufacturer who is not using SO_2 in any of his bleaching processes is missing an opportunity to cut costs and improve the quality of his paper"

Hiram B. Channon, technical consultant for Virginia Smelting Company, discusses the economic advantages of sulfur dioxide to paper manufacturers.

Hiram B. Channon, a "Virginia" technical consultant.

Q How, specifically, is SO_2 used in pulp bleaching?

A Well, it has many important functions. It is used to adjust *p*H, as a reducing agent, as a decolorizer, and to help remove impurities from pulp after bleaching. It also works efficiently as an antichlor and in the fortification of sulfite acid liquors.

Q Are there other chemicals that will perform these functions?

A Yes, but none with the same overall efficiency. "Virginia" liquid sulfur dioxide is refined to a purity of 99.98%. Being a gas, it leaves no residuals that must be dealt with. And, of course, one of its most attractive features to industry is its low cost.

Q What does this degree of purity mean to papermakers?

A It means that in such concentration, a little of our SO_2 goes a long way. And of course liquid sulfur dioxide is one of the most inexpensive reducing agents available.

Q Can SO_2 be used in all bleaching processes—in ones using chlorine or peroxide, for example?

A Absolutely. In chlorine bleaching, it acts as an antichlor and neutralizes its activity. If the chlorine remaining in the pulp after washing went to the dryer it would cause a deterioration in pulp strength. And SO_2 performs in much the same way when used with the peroxide process. It is also used extensively in the manufacture of chlorine dioxide.

Q Do these functions of SO_2 result in improved paper quality?

A Yes. The brightness of the pulp will be increased several points by "flash" bleaching, and SO_2 helps hold that brightness, preventing color reversion. It can also help cut costs on equipment. Over-all, I would say that SO_2 gives the manufacturer a better, more salable product, whether it is made from bleached or semibleached kraft, groundwood pulp or sulfite pulp.

Q How can "Virginia" help paper manufacturers?

A Through our long experience in supplying SO_2 to the pulp and paper industry we have accumulated a great deal of know-how in every phase of pulp processing where SO_2 is used. Our technical service has helped customers in many ways—with wet strength problems, in getting more brightness points, and so on. And naturally we are skilled in SO_2 transportation, storage, handling and control. Our technical service, I know, has been one of the major factors in the excellent relations we enjoy with our customers.

Q Does "Virginia" supply other chemicals to the paper industry?

A Our "Virginia" Zinc Hydrosulfite is one of the best known of the groundwood pulp bleaches and is used by most of the leading paper manufacturers. Where the process is set up to use it, we also supply sodium hydrosulfite.

• • •

IF YOU ARE INTERESTED IN WHAT SO_2 CAN DO FOR YOU—

just write us on your company letterhead. We will be pleased to send you technical information or have a representative call to discuss the use of SO_2 with you.

Industrial Division
VIRGINIA SMELTING COMPANY
Dept. 211, West Norfolk, Va.

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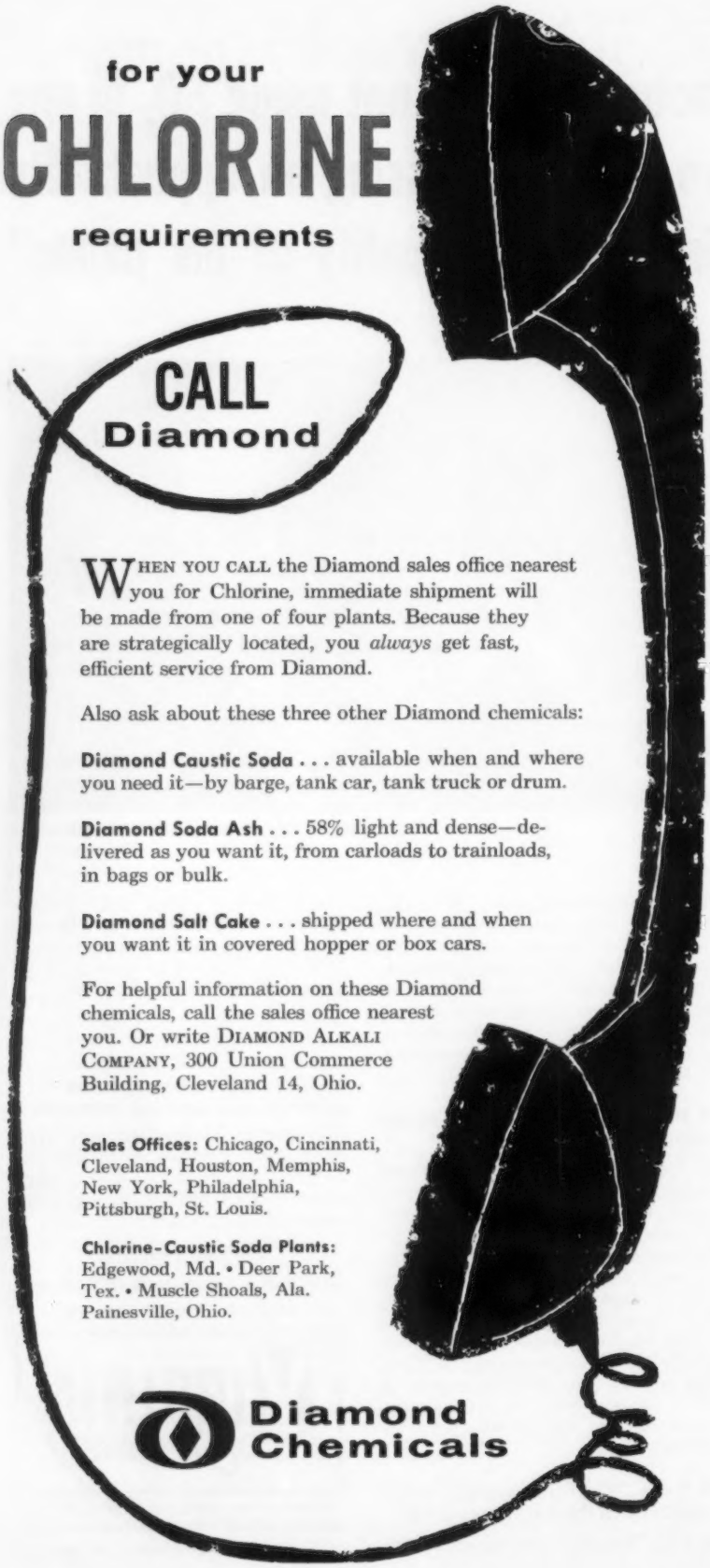

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Diamond Chemicals

nomic principles. One film I remember particularly is titled "In Balance." There is a series of Disney-type cartoons obtainable from Harding College. The American Economic Foundation has a group of nine films, which form a discussion series; "How We Live in America," which is very good.

2—Flannel Board Presentations. There are the purchased-type of flannel board presentations, such as "Hobso," "How Our Business System Operates," and "The Value of Your Dollar." Also there is the type developed by your own group. One of our mills has produced two presentations which are economic in flavor, "The Power of Teamwork," and "No Sale — No Job."

3—Reading Material. There are books, such as "Dynamic Economy" (a study course involving role play and discussion); "Shirt Sleeve Economics;" "How to Think About Economics" (Clark & Rimanoczy); and "The American Economic System."

The American Economic Foundation sends out short, pertinent reading pieces on "Economic Facts of Life" and current economic problems. There are other sources of pamphlets and reading material on the subject.

Remember the foreman will be interested in this training to the same extent that you are interested. He wants to please you. Also, remember that this training must be a continuous thing. Three or four times a year, show a movie or a cartoon, such as "Meet King Joe" or "Why Play Leapfrog," in connection with a dinner meeting for the foremen. Circulate articles and pamphlets about economics. Have your training coordinator develop a flannel board presentation for them to present to their crews. Send them to conferences when possible. Your reward will be that unconsciously your foremen will be able to promote productivity and cost reduction in their everyday contacts with their crews.

There is another large area in foremen training for cost reduction which I can only touch on briefly. The foreman is the department supervisor most instrumental in controlling the variable elements which enter into the cost standards. He is the person that conveys cost consciousness to the crew leaders working for him. It is by his understanding of all cost elements that the proper hour by hour decisions are made which affect the mill costs. He needs training in the details of the cost system; and he should help in the development of the cost standards which are established annually by the operating departments.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.

SPROUT-WALDRON

Pointers

Refiners • Digesters • Conveyors • Feeders
Screens • Drainers • Pelleters • Presses • Stock Proportioners

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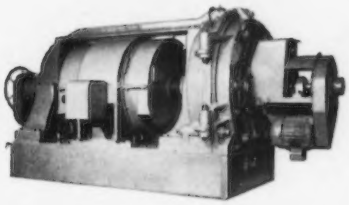


COLD CAUSTIC PULPING OF EUCALYPTUS WOOD

Behind the technical story of successful cold caustic pulping, soon to be revealed by Australian Newsprint, is the superb performance of three 36-2 500 hp "Sprouts." Refining of eucalyptus woods for use in newsprint is being accomplished at 50 hp days per O. D. ton. Consistent yields of 90% are being achieved. The CSF is 150.

Prior to the installation of the Sprout-Waldron cold caustic process, the furnish for newsprint at this Tasmanian mill was 18% bleached kraft (pine), 82% eucalyptus groundwood. Machine speeds were 1080-1200 ft. per minute. With cold caustic refining, the furnish is 18% bleached kraft, 20% cold caustic and 62% groundwood. Machine speeds have increased by 100 ft. per minute and newsprint strength is equal to the world's best.

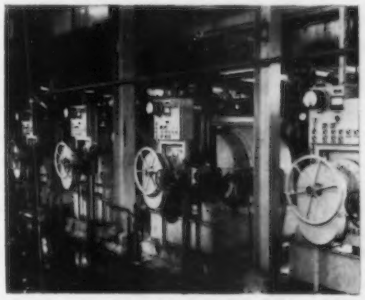
For the full story on this and other Sprout-Waldron cold caustic installations, call or write today. Sprout-Waldron experience with cold caustic refining is based on successful installations and actual production. Why not put this experience to work for you without obligation?

Sprout-Waldron has a condensed catalog available for your use. Ask for Bulletin 183.

S-W REFINERS PLAY BIG ROLE IN "DREAM" PLANT

The American Boxboard Company at Filer City, Michigan is a "dream" plant come true. It is a pushbutton pulp mill set up to process over 300 tons per day continuously, seven days a week, requiring only two operating men plus a clean-up man for each shift. The 450 HP S-W refiners fit right into this picture of precision operation and automatic control. Each of the five 36-2 single disc refiners has its own automatic control panel which contains an indicating KW HP meter; RPM meter for the variable screw feeder; speed control for the feeder; pushbuttons and indicating lights for the refiner motor, throat screw feeder and oiling system. This combination of high speed, carefully metered feeding and the precision operation of the refiners means one pass quality reduction of chips to fiber.

One of the highlights of this NSSC pushbutton system at American Boxboard is the fact that it permits the use of the prolific aspen wood in place of the more expensive jack pine formerly used.



Four of the five 450 hp 36-2 Sprout-Waldron refiners helping to make .009 corrugating board for American Boxboard.

FLAT BED DRAINER DEWATERS CHIPS & REJECTS

The Sprout-Waldron flat bed drainer de-waters or drains chips and rejects conveniently and economically while providing a steady even flow. It operates on the principle of a drag conveyor, with the stock traveling over a stainless steel screen plate to permit the necessary separation of liquids and solids.

The use of this modern flat bed drainer has proved particularly successful in systems designed by Sprout-Waldron for feeding semi-chemical chips from blow tanks. Such systems include efficient proportioning arrangements, accurate feed rate regulation and freedom from valve plugging. Flat bed drainage increases efficiency of any feeding system by assuring proper consistency of stock and providing even steady feed. Features include flexible and adjustable leather scraper blades, special wear-resisting nylon blocks to reduce friction, special anti-friction bearings and a wide variety of available screen areas from 12 to 50 sq. ft.

SW

LABORATORY MIXER

The small, compact S-W laboratory mixer designed for research and pilot plant work is described and illustrated in Bulletin No. 188.

PP/102

Control of Pitch in Sulphite Pulp

A report on Mead's mixer method of pitch determination and their successful use of bentonite as a control agent.

B. P. Bunch and C. D. Coates
Mead Corp.
Chillicothe, Ohio

When a very serious pitch problem confronted us in our papermaking operations in Chillicothe, one of the first things undertaken, in outlining a course of operation to follow, was to conduct a literature survey to determine just what had already been accomplished and written about on this subject. The scope of the work done in connection with pitch amazed us. The literature survey revealed a large variety of methods proposed to control pitch, although many of these were qualified with the general statement that, "What will work in one mill may not work in another". For this reason, the idea was advanced that case histories may be of little value to other mills. Obviously, we do not subscribe to this line of reasoning; for the information we have to present at this time stems entirely from the case history of a pitch problem and its successful conclusion at our Chillicothe plant. We feel reasonably sure that our findings and subsequent actions can be effectively transplanted to other mills that are represented here today.

We purchase unbleached Canadian sulphite pulp for Chillicothe, and subsequently bleach it to an 83 G.E. brightness in a 20-year-old, two-stage bleach plant. The pulp is first made-down in beater-type pulpers, then batchwise pumped to a chlorination tower of approximately six-ton capacity. After a batch has been chlorinated and then neutralized with milk-of-lime, it is washed over a vacum washer and belt conveyed at 10-12 percent consistency to the hypochlorite bleaching towers. In the second stage, we use calcium hypochlorite bleaching liquor. This stage is then followed up with a washing step. At this point, the bleached, washed pulp is diluted to 4.5 percent consistency, and used in a variety of bond and book grades of paper in the mill.

One of the largest consumers of this bleached sulphite pulp is our No. 9 paper machine, which makes machine-coated grades exclusively. It was on this particular machine that the pitch problem under consideration became acute. In the spring of 1955, we were besieged with spots occurring in the fourdrinier wire. These tiny specks of pitch would cause a thin place or hole in the sheet, which in turn led to calender cuts in the finished product.

During this same troublesome period, our No. 8 and No. 11 machines also were experiencing difficulties that could be traced directly to our pitch problem. In these cases, it was the dandy rolls that were filling up with pitch spots; but these spots fortunately could be removed without excessive lost machine time by the liberal use of steam hoses.

Removing the spots from the wire on No. 9 machine, however, was a most time-consuming job. There, too, our most successful tool was a steam hose, although we tried all sorts of solvents and brushes to no avail. As a matter of fact, one siege of spots was so hopeless on No. 9 machine that it was economically advisable to cut the wire off the machine and put on a new wire in order to resume quality production.

One morning about that time, the paper mill superintendent reported that No. 9 machine's dandy was filling up so rapidly with pitch specks that it was necessary to steam the dandy after every turn-up. Grasping for straws in this early part of the pitch campaign, the suggestion was made that this would probably be a good place to try a polyphosphate as a pitch controller and to add some to the beater just ahead of the paper machine. The superintendent was told, "You can't be any worse off than you are now". We didn't know how wrong we could be! The pitch was effectively dispersed; but so was all the system dirt from the beater to the paper machine headbox. The polyphosphate just plain scoured everything clean. All that dirt moved out onto the wire. Needless to say, it was necessary to dump the system and wash up the machine. The laboratory thus lost round one in its battle with pitch.

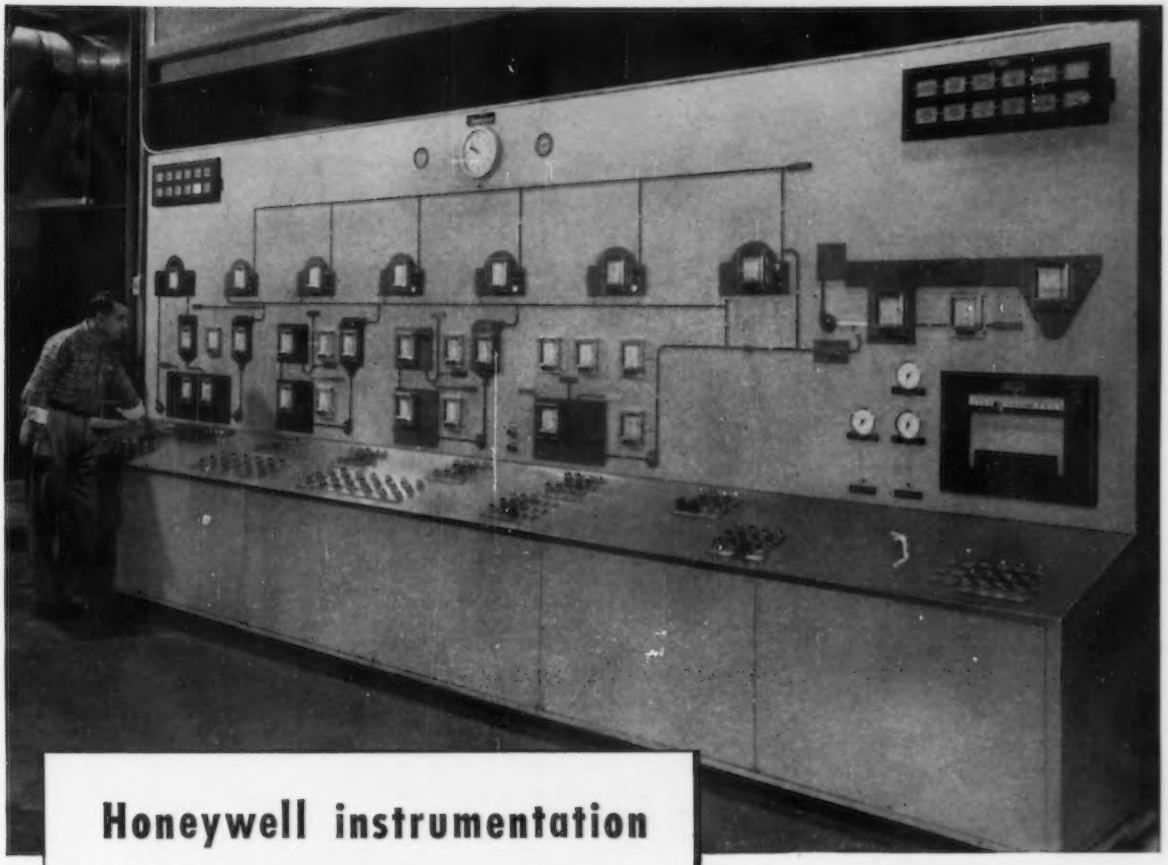
After this costly bout with pitch, we began an intensive "anti-pitch campaign", both in the mill and in the laboratory. We knew from previous experience that dispersants, diatomaceous earths, and the aging of unbleached pulps in a storage area had some small measure of success; but we were after one good, foolproof method for the solution to our problem.

Our first step in the bleach plant itself was changing to cold water (55° F.) for making-down the unbleached sulphite in the pulpers. This move prevented most of the pitch from coating the sides of the pulpers; but did not help in the overall problem.

The pitch would still deposit out elsewhere in the system whenever the temperature of the stock was increased. Some pitch would still build up on the sides of the pulpers. This potential troublemaker was nipped in the bud by a series of regularly scheduled boilouts in the pulpers, using a mild caustic solution. This prevented the pitch from accumulating to the extent where pitch balls could break off into the stock system. Although, at present, we essentially have eliminated our pitch problem, we still follow a regular boil-out procedure (at much longer intervals now) as a further preventive measure for the protection of our paper machines.

When it had been demonstrated that the use of cold water was not our sought for cure-all, we began to use alum as a pH controlling agent for our make-down water in a second attempt to solve our pitch problem. We assigned laboratory technicians on an around-the-clock basis to carefully control the pH of the make-down water in the 4.5 to 5.0 range. Our results with pH control were negative. Pitch problems persisted on the paper machines running on the acid side as well as on those machines making coated papers operating at a pH of about 7.5.

In our third step in the mill, we were able to gain temporary relief from pitch trouble by using West Coast sulphite pulps, which seem to have an inherently lower pitch content. These



Honeywell instrumentation controls stock preparation for new *Clupak** paper

This custom-designed Honeywell panel controls stock preparation for the *Clupak* paper process. It also provides a constant measure of efficiency by recording the amount of power required to prepare each ton of stock.

When West Virginia Pulp and Paper Company recently developed strong, stretchable *Clupak* paper, it turned to Honeywell for the extremely accurate controls required to produce the new product. The custom-designed graphic panel shown above is part of the new system. It guides the stock preparation process with the especially critical accuracy demanded.

Other leading paper producers also rely on Honeywell for accurate, economical control of papermaking processes. Have Honeywell custom-fit a control system to the *exact* requirements of your own mill . . . for either present processes or completely new ones.

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First in Controls

TABLE I

Pulp	Mead Mixer Method g./200g.	TAPPI Extraction Method % B.D.
C	.028	.603
C	.034	.711
B	.143	.890
B	.070	.698
A	.092	.593
B	.119	.711
B	.127	.768
B	.054	.793
B	.050	.695
B	.048	.761

were blended with other unbleached sulphite pulps that had been aged for six months or longer at the mill. This method was not at all practical from the standpoints of double handling, tying up major storage areas, and so forth.

While we were proceeding on a trial and error basis in the mill, we were working concurrently on the problem in the laboratory. We began by making pitch determinations, following TAPPI standard method T-204 M-46 to the letter. We found little correlation between the total pitch content of the unbleached sulfite pulp, as determined by the ether-alcohol extraction method, and the pitch troubles in the mill. This pointed out to us the need for a test that would show how much of the pitch would deposit itself on our equipment under controlled conditions. With this in mind, we devised a "mixer-method" for determining what we called "troublesome or sticky pitch". This was not an original idea of ours. It was our adaptation of a method described in previous literature that indicated the possibility of quantitatively predicting in the laboratory which types of pitch in pulp will cause a papermaker grief in the mill.

Briefly the test method we devised is as follows: 200 grams of pulp at 4.5 percent consistency are stirred in a stainless steel beaker for two hours at 16° C (60° F.). At the end of this time, discard the pulp; but carefully extract the pitch deposited on the sides of the beaker and stirrer with boiling ethyl alcohol. Then evaporate the alcohol overnight in a tared beaker, and report the resulting pitch deposit as grams of pitch per 200 grams of pulp.

It has been our observation that duplicate samples check well with this mixer method.

Table I shows the pitch content of several shipments of unbleached sulfite pulp by the two laboratory methods now available to us: the ether-alcohol extraction method; and the Mead mixer method.

As one can see from this table, the amount of pitch present in the pulp, as shown by the TAPPI method, gives no indication as to the amount that will deposit on papermaking equipment in the mill.

With the mixer method available to evaluate materials for pitch control, we were able to accelerate our laboratory program, and ultimately our mill program. Volcanic clay, known to most of us as bentonite, showed great promise in the laboratory. This was one of the first and most beneficial discoveries to be uncovered by the use of the Mead mixer method. This is dramatically shown in Table II, which contains data obtained on the amount of pitch deposited in the laboratory test versus the percent bentonite used as a controlling agent:

TABLE II

% Bentonite	Grams of Pitch Deposited
—	.146
.25	.092
.50	.048
.75	.031
1.00	.021
1.25	.016
1.50	.016
2.50	.016

These data show that bentonite in excess of 1.25 percent did not effect any further reduction in the amount of pitch deposited in the test. Nearly 90 percent reduction in depositable pitch was accomplished with bentonite, a promising indication that a fairly cheap controlling agent was available to the papermaker. At this point, we began to use bentonite in the make-down pulpers, and continued our laboratory work with bentonite.

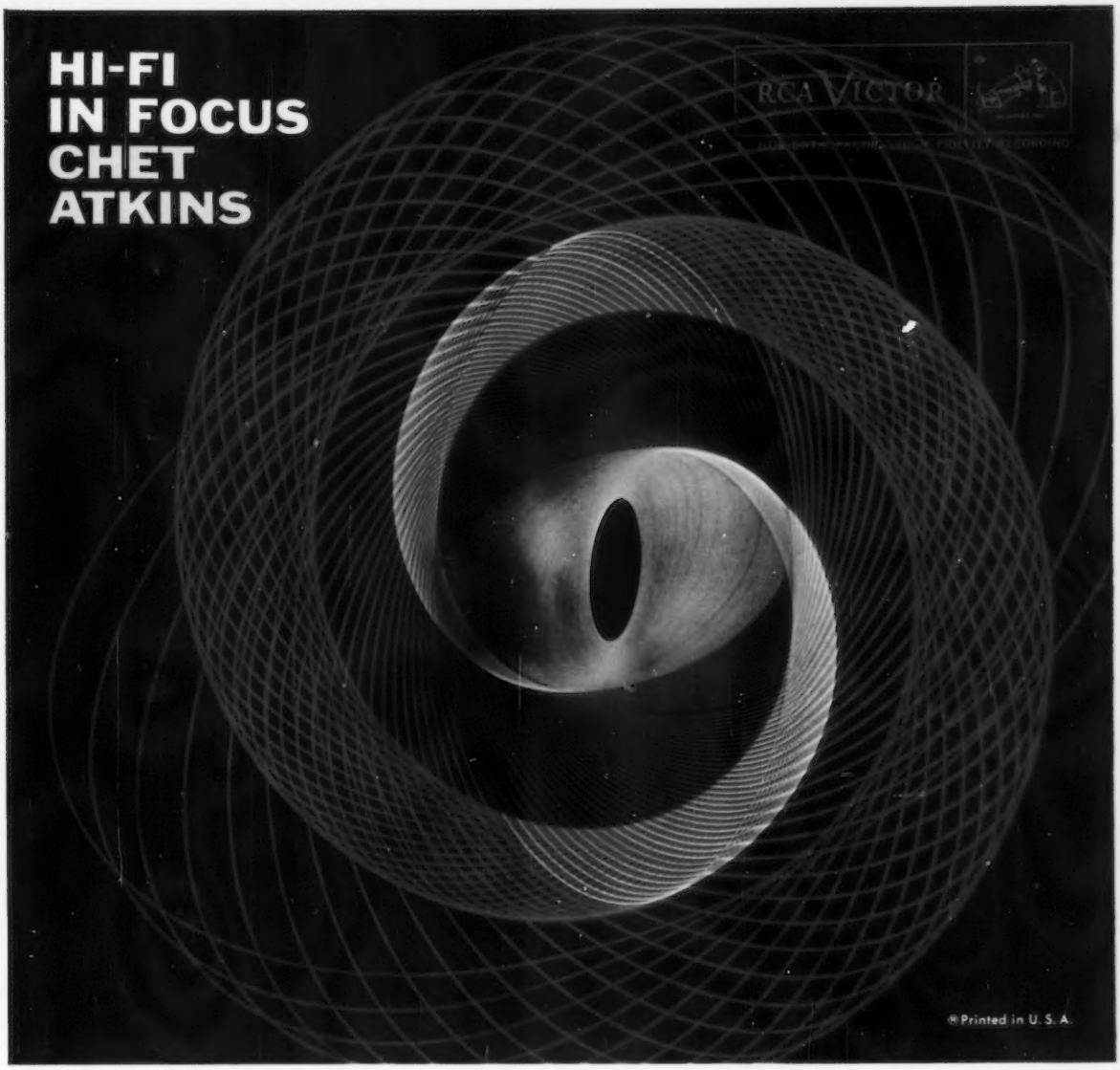
We tested two grades of bentonite, the granular and the powdered grades, using the former grade in the mill. The granular bentonite is easier to handle, gives off less dust, and is not as disturbing to the respiratory system as the powdered grade. A curve plotted from our data shows, however, that the powdered grade more effectively coats the sticky pitch than does the granular grade. These data were obtained by using the mixer method, in which less pitch was deposited when the powdered grade was used.

When this discovery was made, the mill changed from the granular grade to the powdered grade of bentonite. It must be said, however, that the granular grade did a most satisfactory job of controlling the pitch in the unbleached sulfite pulp when it was used. The decision to use the powdered grade was partly made because it was cleaner than its granular counterpart. It was found that granular bentonite contained large quantities of objectionable material, (grit), that had to be screened out of the system before the bentonite could be applied to the pulp.

The powdered form of bentonite does not make-down into a slurry as easily as the granular grade, and some extra time is thus required. Our laboratory work pointed out that the bentonite is much more effective if it is added to the make-down water *before the pulp is charged to the pulpers.* In our early mill trials, dry bentonite was added to the water in the pulpers; but there was some doubt as to whether this was the proper way to disperse the powder. If 25 pounds of bentonite, for instance, were added too rapidly to the water, the powder would ball up; and thus become much less effective as a control agent. For this reason, a bentonite make-down system was devised so that slurry bentonite could be added at the pulpers. This method of dispersing bentonite proved most satisfactory.

We found that 0.33 of a pound per gallon was a desirable concentration for making-down and pumping slurry bentonite. A 200-pound batch was made down in a 600-gallon tank with the aid of a Lightnin' mixer. From the make-down tank, the slurry was pumped into a 50-gallon measuring tank beside each pulper, and then emptied into the pulper. The make-down operation had to be done rather slowly to prevent the powder from balling up (as it would in the pulpers). This was accomplished by using a funnel to add the powdered bentonite to the water in the make-down tank. The funnel had a capacity of 100 pounds. Also, it was tapered to a one-inch square discharge hole so that the bentonite would sift into the water at a controlled slow rate.

Contrary to what one might suppose, it is not necessary to use a dispersing agent to get the individual bentonite particles separated from each other. The key to effective make-down is simply to give the bentonite enough water and agitation to allow swelling to take place. When bentonite is satur-



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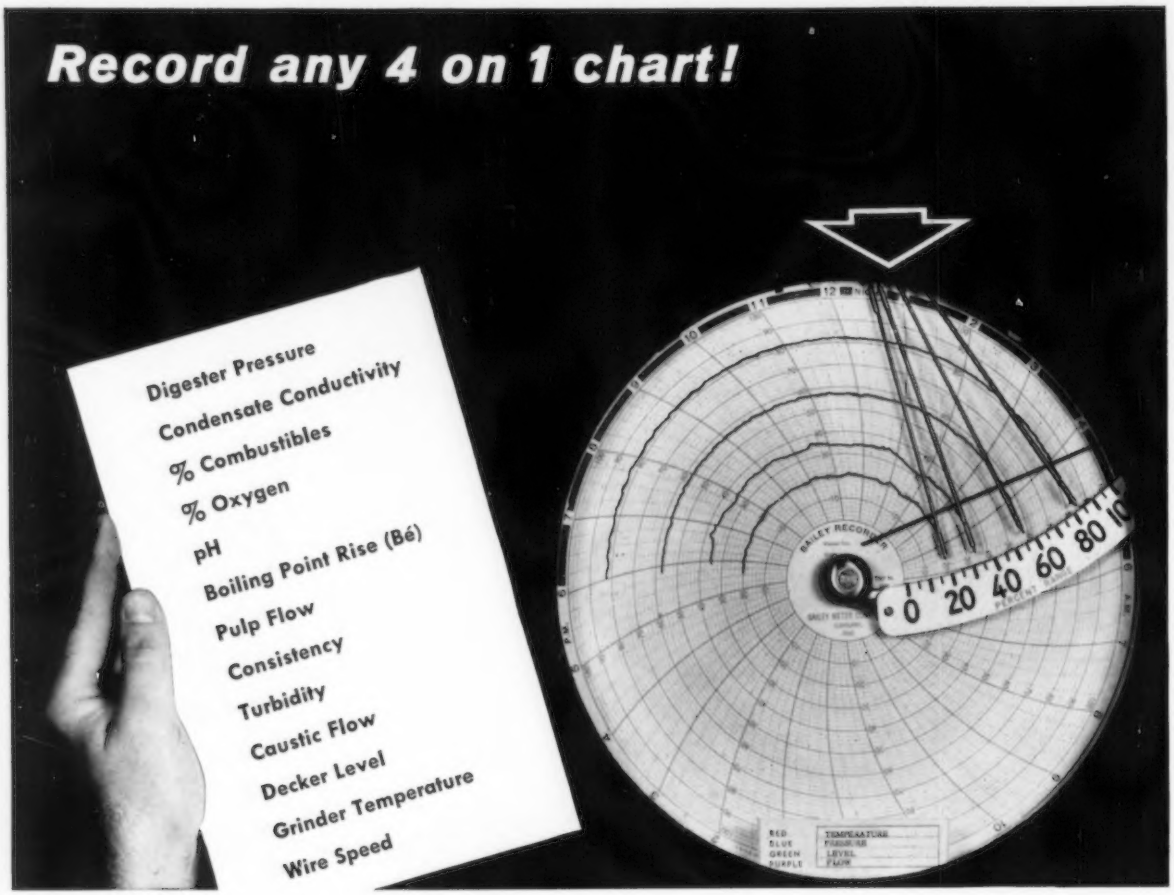

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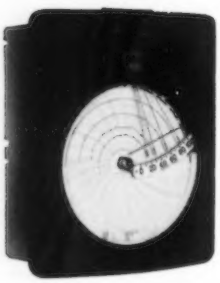

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Instruments and controls for power and process

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ated, it splits into almost infinite fineness; so that the slurry produced will pass through a 325-mesh screen.

In addition to the bentonite that was added at the pulpers, we also added a lesser amount to the pulp after the first washing in the two-stage bleach plant. In order to evaluate the merits of this procedure, we decided to determine the pitch content of the pulp as it progressed through the bleaching process. By running pitch tests by the Mead mixer method and by the conventional TAPPI alcohol extraction method, we hoped to find out what happens to the pitch during the bleaching process, and also, to determine how well the bentonite covers the pitch throughout the bleaching and washing operations.

We selected what we reasoned to be a representative batch of pulp, and samples of the pulp were taken at the following points in the bleach plant.

TABLE III

(a) chlorination tower — before chlorine was added
(b) chlorination tower — after chlorination, but before lime water was added
(c) interstage washer — after washing, but no bentonite added
(d) interstage washer — after washing, with bentonite added
(e) final washer — after washing

The results of the alcohol extraction tests showed that the pitch content does not change appreciably throughout the bleaching stages, and the pitch is still in the pulp as it is delivered to the beater rooms for use. The results of the tests were erratic, but the trend is unmistakable.

Sample	% Pitch
a	.675
b	.842
c	.883
d	.635
e	.840

It is interesting to note that the bentonite present in the pulp possibly has some effect on the amount of pitch extracted by the alcohol. The sample taken in the chlorinator contained the bentonite that had been added in the pulpers, and it showed only 0.67 percent pitch. After chlorination, the pitch content was shown to be 0.842 percent; and after washing, the pitch content rose further to 0.883 percent—indicating that some bentonite may have been washed away, leaving the pitch more susceptible to extraction. When more bentonite was added at the interstage washer, the pitch test again came out low, 0.635 percent; but it rose to 0.840 percent after the final washing operation. The bentonite present in the pulp may have restricted the amount of pitch extracted in some of the samples, but the overall results show that the pitch is not removed from the pulp during the bleaching and washing operations in the two-stage bleach plant. This probably would not be the case in a plant equipped with a caustic extraction stage, since some saponification could be expected to take place there.

The mixer method of pitch determination clearly showed that the pitch was covered effectively by bentonite in all of the samples taken:

Sample	Grams of Pitch Deposited
a	0.0055
b	0.0050
c	0.0055
d	0.0050
e	0.0045

With a starting pitch content of 0.0700 g. by the Mead mixer method, this test demonstrates that the bentonite did an excellent job in reducing the depositable pitch to 0.0050 g. on the average for all the samples taken throughout the bleaching process. The data further show that the adding of additional bentonite at the interstage washer is not necessary because the bentonite added at the pulpers remains a most effective control agent by itself.

A second batch of sulphite pulp was spot checked for pitch content, both in the chlorinator and after the final washer, in an attempt to verify our findings in the first experiment. The check points turned out to be quite close to the first results obtained, again using both pitch test methods. The two curves obtained, as shown in Table "E", are superimposed on one chart with two sets of scales to demonstrate that the bentonite covers up the pitch extremely well throughout the entire operation, while the actual pitch content of the pulp does not change appreciably.

"You're hired!"

In this same experiment, it was originally planned to run ash determinations on the samples taken to determine how much bentonite was washed out of the pulp at the interstage washer. These tests were not successful, however, due to the fact that the use of lime water for neutralizing the chlorinated pulp led to greater ash contents after the washing took place because particles of calcium hydroxide were not removed from the pulp. The use of lime water may partially explain why pitch is not removed by washing at the interstage washer, since some literature[1] available states that "lime precipitates insoluble calcium salts of pitch which adhere to the fibers due to their sticky nature".

In bringing this discussion to a close, we would like to summarize a few of the facts that were uncovered by using our newly developed Mead mixer method in conjunction with the TAPPI standard extraction method:

1—The mixer method provides a means of predicting which pulps have pitch contents that are likely to give our papermakers trouble. At Chillicothe, we were able to do this effectively on a car by car basis.

2—The total pitch content of sulphite pulp, as shown by the extraction method, is not indicative of pitch trouble that might be imminent.

3—Troublesome pitch, that pitch which will deposit on mill equipment, can be made impotent under certain conditions, by the proper use of a bentonite slurry.

4—Pitch remains in the pulp throughout our two-stage bleaching process.

5—Bentonite remains effective as a control agent throughout the bleaching and washing operations.

6—If the proper amount of bentonite is added at the pulpers, it is not necessary to use additional quantities elsewhere in the system.

In the two years following the institution of our bentonite slurry system, we have not had a single incident of serious consequence from pitch in our paper mill. *"The proof of the pudding is in the eating."*

[1] Solvay Process Co.—Report 124.37, August 20, 1937.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.

Evaluation of a "Hot Press" Installation at Chesapeake Corp. of Virginia

Part of a five year revamping program, the hot press installation has proven to be very satisfactory. A definite increase in production and a steam saving have been realized.

G. T. Edmonds and R. E. Bowyer
Chesapeake Corp. of Virginia

The installation of a hot press was the completion of a five year revamp program for our paper and board machine. Prior to this installation the following improvements had been made:

1—New stock preparation equipment installed-six Sutherland refiners.

2—New fourdrinier and stainless steel wire pit.

3—New dryers and dryer drive and increased steam pressure from 60 to 120 pounds on high pressure section of the dryers.

4—New reel.

5—New winder.

The installation of the hot pressing arrangement at Chesapeake was one of three changes made in the machine in July of 1956. These other changes made the separate evaluation of the "Hot Press" more difficult. The complete renovation included a pressurized secondary headbox, the "Hot Press" arrangement with smoothing press, and the addition of 14 new dryers on the dry end.

The installation of the hot pressing arrangement consisted of:

1—Shortening the draws of the first and second presses.

2—Removing the existing reverse third suction press.

3—Removing six dryers from the dryer nest and relocating after second press.

4—Installing a new suction third or "Hot Press".

5—Installing the new smoothing press.

6—Installing a new 6500 cfm vacuum pump for the third press.

The machine today has a 244 in. x 127 ft. 5 in. wire, a 54 in. diameter suction couch, a 30 in. lump breaker roll, a 34 in. diameter suction first press, a 36 in. suction second press, six pre-dryers with two felt dryers, a 42½ in. third press, and 66 more paper dryers with 16 felt dryers (a total of 72 paper dryers including the pre-dryers). Detailed roll descriptions are recorded in Table 1.

Evaluation

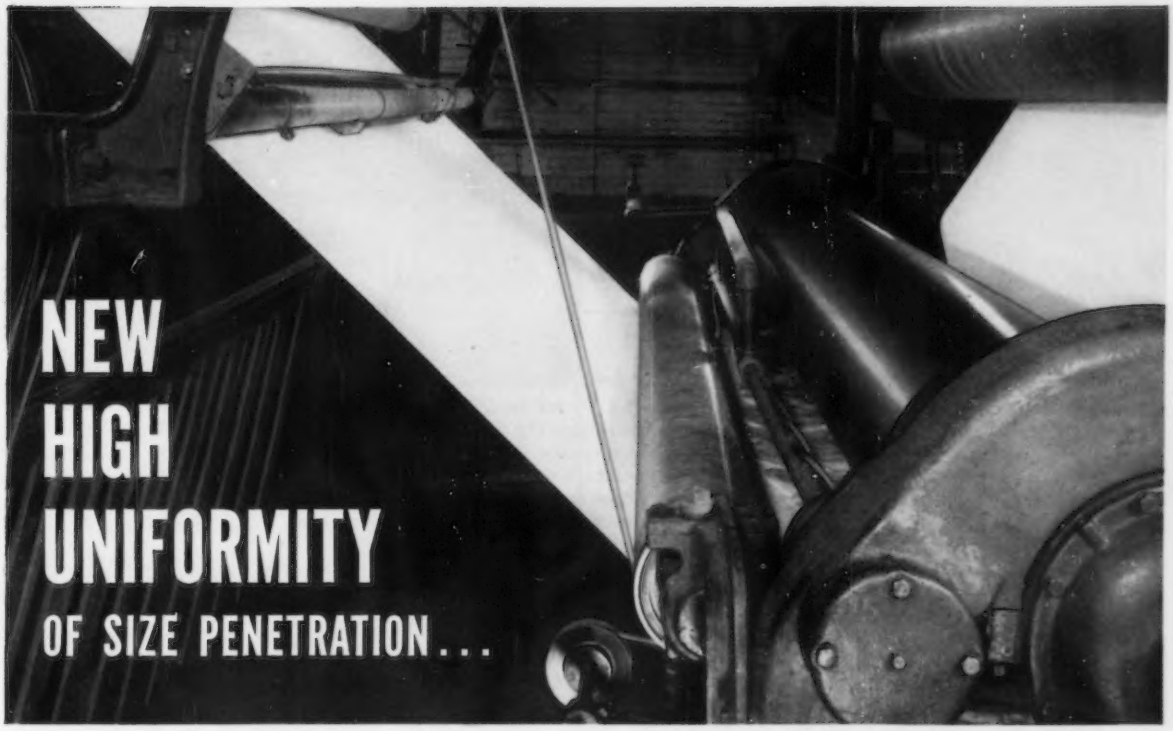
Prior to our rebuilding program five years ago, the old machine was rated at 400 tons per day with a maximum speed of 1000 f.p.m.

Production: The maximum daily output from the machine since July 1956 has been 751 tons per day of 42-lb. liner. Prior to this last phase of the renovation, top production was 600 tons per day. This indicates an increase of 151 tons per day or 25 per cent. This, of course, is total increase attributed to the hot pressing arrangement and the addition of 14 paper dryers. To attempt to distribute the increase accurately between the two improvements would prove difficult; however, a comparison of moisture tests and steam con-

TABLE NO. I—ROLL DESCRIPTION

Position	Diameter	Covering	Plasto-meter P & J	Suction Drilling	Box Size	Nip Pressure Lbs/I"
Couch	54"	Brass	—	0.312	14"	
Lump Breaker	30"	Self-Skinner Neoprene	215	—	—	30 lbs.
1st Press Bottom	34"	Brass	—	0.187	4"	
1st Press Top	29½"	Self-Skinner Neoprene	40	—	—	170 lbs.
2nd Press Bottom	36"	Hard Rubber	10	0.125	4"	
2nd Press Top	29"	Self-Skinner Rubber	40	—	—	175 lbs.
3rd Press Bottom	42½"	Hard Rubber	10	0.156	8"	
3rd Press Top	36"	Rubber	30	—	—	385 lbs.
Smoothing Press Bottom	34"	Brass	—	Plain	—	
Smoothing Press Top	34"	Rubber	38	—	—	215 lbs.

Paper presented before the 39th annual convention of the American Pulp and Paper Mill Superintendents Association held at Hotel Statler, Boston, Mass., June 3-5, 1958.



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At the size press — and at the reel — Foxboro Sheet Moisture Control is your assurance of better quality paper. Write for Bulletin 10-4. **The Foxboro Company, 236 Norfolk St., Foxboro, Massachusetts, U.S.A.**

"Our quality standards are more easily maintained," reports West Virginia Pulp and Paper Company as a result of this Foxboro Moisture Control System. Cabinet shown here contains Dynalog Electronic Moisture Controller (top) and Temperature Controller (bottom).

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AUTOMATIC SHEET MOISTURE CONTROL

TABLE II—MOISTURE TEST DATA

	Prior to "Hot Press" Installation				After "Hot Press" Installation			
Date	6-26-56	5-2-55	4-19-55	4-16-55	1-8-57	12-6-56	9-18-56	9-3-56
Speed f.p.m.	966	924	910	910	1000	1200	1200	1280
Place Sampled	Per Cent Bone Dry Consistency							
Couch	25.37	24.57	24.89	25.08	24.78	24.37	25.25	not taken
1st Press ...	29.21	28.06	29.12	28.81	29.61	29.12	30.19	not taken
2nd Press ...	32.36	32.06	31.98	31.83	32.22	31.39	31.82	29.38
Pre-Dryers ..					32.66	31.76	32.44	32.25
3rd Press ...	33.92	33.49	33.26	33.80	37.92	36.72	37.44	37.74

sumption before and after the installation will reflect the merits of hot pressing.

Moisture: The purpose of the six pre-dryers is to raise the sheet temperature for better water removal at the third press. No attempt is made to evaporate any water in this area. There are no exhaust fans in this area and all vents were closed. The six dryers have proven ample to raise the sheet temperature to 160°F.; in fact, the dryers usually operate at a reduced steam pressure of 20 to 30 p.s.i. on 42-lb. liner. Temperatures were determined at the time moisture samples were taken, by inserting a thermometer into a wad of paper immediately after breaking the sheet down just before the third press. No attempt has been made to raise the sheet temperature above 160°F. as, theoretically, temperatures above this level are of little value in reducing the viscosity of water. In addition, other mills, which have experimented with higher temperatures, have encountered difficulties with wet end breaks.

We limited moisture test to 42-lb. liner and tests indicate the bone dry consistency before was 34 per cent, is now 38 per cent, or an increase of 0.31 pounds of water removed per pound of stock. This represents an increase in water removal of 16 per cent, which is attributed to hot pressing. This data after the installation was recorded at a much higher machine speed. As shown in the fifth column in Table II, the machine speed was reduced to 1000 f.p.m. to obtain a more favorable comparison with the data before hot pressing. This shows an increase in water removal as compared with the higher speeds, as expected.

Steam: The first 17 dryers and felt dryers operate off a steam supply of 55 pounds per square inch at 330°F.; the remaining dryers operate off a steam supply of 120 pounds per square inch at 420°F. Limited test indicated a steam saving of approximately 10 per cent on 42-lb. liner. The total steam saving on all grades since the hot press installation as compared with the average for one year prior to installation is 12 per cent. This figure includes the grades (26 lb. liner and lighter) which are produced without the third press operating; it also includes the steam used for purposes other than direct paper drying.

Mullen and Caliper: Hot pressing produced a more dense sheet. A slight decrease in caliper on 42-lb. liner has occurred. This result was expected and has not been a serious problem. A comparison of the mullen test on 42-lb. liner since July with the average for the year prior shows a five per cent increase. This has been accomplished with a noticeable decrease in the use of wet end additives.

Wire and Felts: The wire and felt life has been relatively unaffected by the hot pressing operation. The average life for a year prior to the change and the nine months following are tabulated below:

	1 yr before		9 mths after	
	days	tons	days	tons
Wire	23.5	10,486	23.3	11,069
1st Press	25.6	11,697	25.0	11,905
2nd Press	27.5	12,636	23.8	11,844
3rd Press	22.5	10,170	22.3	11,099

The most satisfactory third or "Hot Press" felt has been a fine press felt weighing four ounces per square foot with some synthetic fiber content. Some experimenting was done with common wet felts at this position. This proved to be unsuitable as the felt markings were evident in the finished product.

Pre-stretched, 54 ounces cotton felts are used on the pre-dryers, top and bottom. The results have been very satisfactory. The felts were removed after six months of operation and were still in fair condition. No difficulties have been encountered with felt marking at this position.

Our Conclusions Are

That the hot press installation has proven to be very satisfactory. A definite increase in production and a steam saving have been realized. The disadvantage of lower caliper has not been serious. Sheet marking from felts or shell was eliminated by proper selection of felts. Mechanical and sheet handling difficulties which were expected, failed to materialize. The machine is easier to thread on a start-up today than it was with the reverse third press operation. Proper selection of roll coverings is important. The selection at Chesapeake was influenced by the experiences at other mills operating "Hot Presses". The only difficulty in this respect was the loss of the top smoothing press roll covering. This was attributed to incorrect selection of material and not to the operation.

The first nine months of operation were used for testing, accumulation of information, and minor revision. We believe the full potential of the hot pressing operation has not yet been realized since the machine has operated at speeds equivalent to 800 tons per day on some runs.

TABLE III—STEAM CONSUMPTION

GRADE: 42# Liner

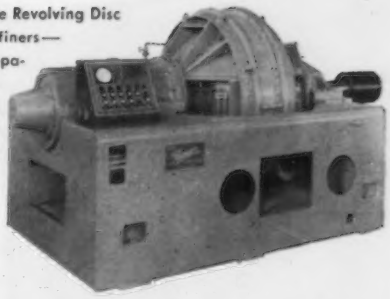
Date	Speed f.p.m.	Production tons/24 hrs.	Steam lbs./24 hrs. High Pr.	Steam lbs./24 hrs. Low Pr.	lbs./steam/lb. paper High Pr.	lbs./steam/lb. paper Low Pr.	Total
6-10-55	950	526.20	2,201,250	909,400	2.092	0.864	2.956
6- 5-55	950	517.63	2,072,500	968,800	2.002	0.936	2.938
6- 2-55	940	526.05	2,348,750	1,002,800	2.232	0.953	3.185
5-31-55	935	526.77	2,273,750	986,800	2.158	0.937	3.095
4-18-55	900	514.56	2,365,000	707,800	2.300	0.688	2.988
				Average:	2.157	0.876	3.033

AFTER HOT PRESSING

Date	Speed f.p.m.	Production tons/24 hrs.	Steam lbs./24 hrs. High Pr.	Steam lbs./24 hrs. Low Pr.	lbs./steam/lb. paper High Pr.	lbs./steam/lb. paper Low Pr.	Total
10- 2-56	1325	735.69	2,907,000	1,032,000	1.980	0.702	2.682
10-29-56	1315	751.29	2,994,000	1,103,000	1.990	0.734	2.724
12- 2-56	1200	677.10	2,613,000	1,048,600	1.925	0.774	2.699
1-20-57	1250	705.88	2,556,000	1,333,200	1.820	0.945	2.765
				Average:	1.929	0.789	2.718

Bauer

EQUIPMENT FOR THE PULP AND PAPER INDUSTRY



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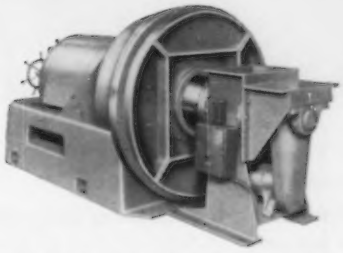
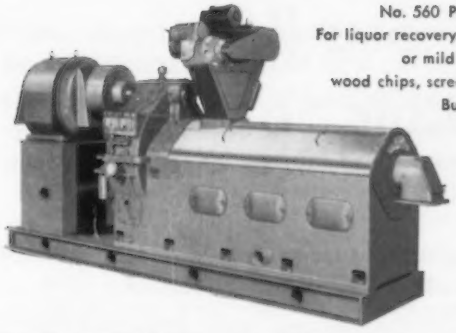


No. 511 Single Revolving Disc Refiners. For dispersing, intensive blending, shredding or fiberizing materials too bulky for double disc refiners. Bulletin P-10.



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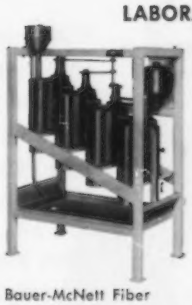

Bauer-McNett Fiber Classifiers. Ask for bulletin.

Laboratory Mills. Bulletin P-6.

Bauer-Mead Lab. Refiners. Bulletin P-5.

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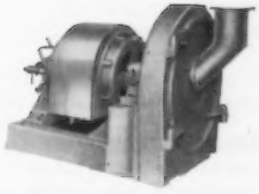

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NOT ILLUSTRATED:

Rapid Cycle Digesters
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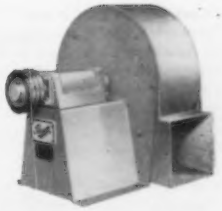
Model M & D Continuous Digesters



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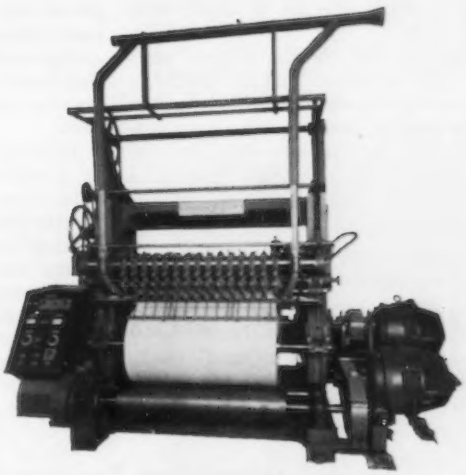

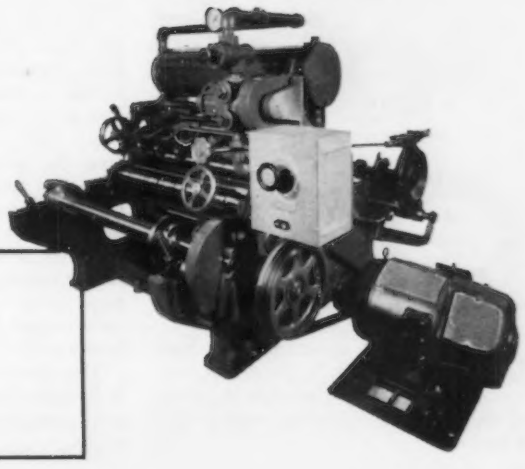

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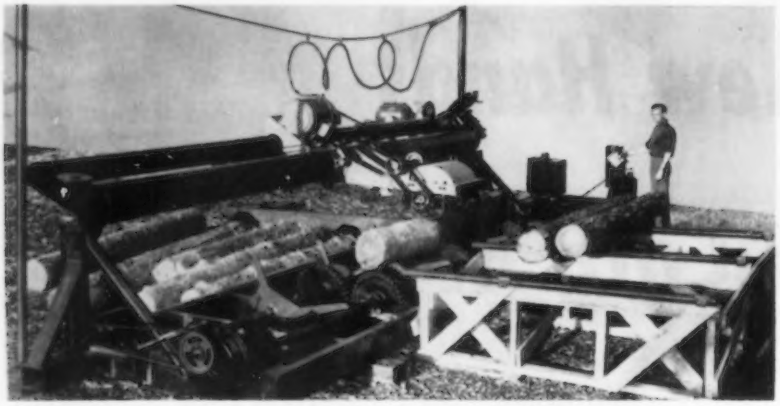


New Barker Offers Choice of Three Heads

The Soderhamn Machine Mfg. Co., Talladega, Ala., are manufacturers of the "DC-6" log barker illustrated above. The equipment will handle logs from 5 to 36 inches diameter, in lengths from 6 to 21 feet.

Logs are fed sideways into the barker, and hydraulic kickers discharge barked logs to the rear. Skids or live decks may be used for infeed and outfeed, and barked logs may be discharged directly to a deck leading to the carriage. All movements are hydraulically controlled from one simple operating station which includes start-stop buttons for both motors. A single lever similar to an airplane control directs all movements of the head and carriage. Three styles of head, readily interchangeable, are available: chain flail, abrader, and planer. Abrader heads are lower on maintenance cost, but the flail head will remove bark on crooked and knotty logs with less wood losses, and is capable of higher production if needed. The planer head is recommended only for mills desiring entirely smooth logs. The chain flail head barks a 22 inch strip; the abrader and planer heads, 12 inches each.

Barking head pressure is controlled by a resiliently mounted hydraulic cylinder to achieve uniform barking of irregular contours. The patented pivoted barking head also provides a leveling device which is extremely important when using flail heads. Embodied in the log kicker is a log stop to insure positive infeed control of logs to the bull wheels. The five kicker arms are spaced for proper support of random length logs.

Kiln Chain Has More Heat Transfer Surface

A scientifically designed link shape for "Thermopruf" kiln chain has been introduced by Allis-Chalmers to reduce operating and maintenance costs in lime kilns.

The new chain reportedly provides one-third more heat transfer surface than conventional chain, permitting a saving in operating heat requirements and a reduction in the chain system size. The increased cross-sectional area also provides greater wear resistance with larger open link areas, allowing maximum flow at the feed end of the kiln and increased heat transfer efficiency throughout the chain system. Heat resistance of the cast, high carbon metal chain is 40 per cent greater than conventional low carbon chain used for heat transfer service.

The chain is available by the link or in lengths, complete with end links, to meet specific chain system requirements.

Liquid Heating System for Paper Machine Dryers

Arrangements have been completed under which Beloit Iron Works and S. Morgan Smith Co. will cooperate in providing a new, patented system for liquid heating of paper machine dryers. Use of liquids with high boiling temperatures (as a replacement for steam) has found use in a number of industries for the system permits higher temperatures at lower pressure as well as improved heat transfer. The system is reported applicable to both Yankee and ordinary paper dryers.

Application engineering and the selling of this equipment in the paper industry will be largely carried out by Beloit Iron Works, Beloit, Wis.

New Polyethylene Coating

A new polyethylene extrusion coating resin for paper, cellophane and foil has been developed by The Dow Chemical Co., Midland, Mich. The material is designated Dow polyethylene 610M, coating grade.

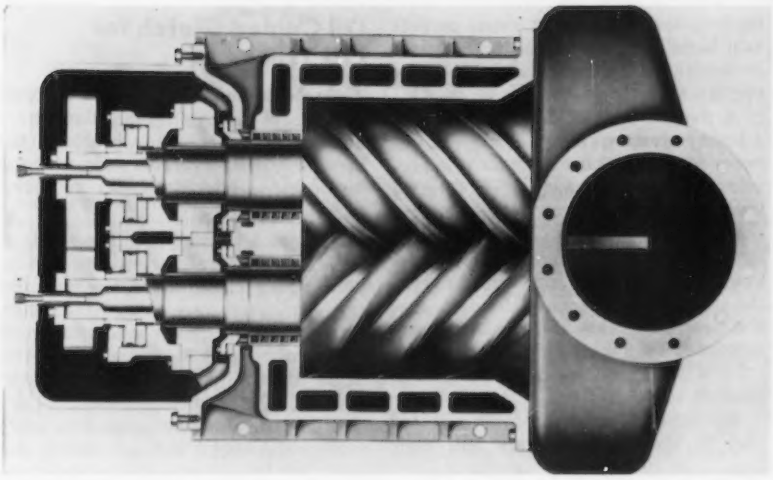
With a melt index of five, 610M exhibits excellent draw-down which results in lower coating weights and increased economy. Dow says 610M has been applied with comparatively good adhesion in thicknesses of .2 mils, and has been run experimentally down to .1 mil.

Use of the resin gives decreased neck-in and consequent decrease in beaded edge. To the laminator this means less trimming and waste. In addition to 610M, Dow markets 700C which has a higher melt index and is used primarily for heavy coatings. The company also has three resins used for wax modification. It is reported these serve to reduce flaking of wax coatings, increase their heat sealability, and improve their gloss and appearance.

New Agitator Drive

The Pfaudler Co., 1065 West Ave., Rochester, N. Y., is currently making a precision gear agitator drive intended for use on 300 through 4,000 gallon vessels. The drive is reported to require a minimum of maintenance, and is said to be unusually quiet in operation.

Features of the "BH" drive are a pedestal mount, interchangeable seal or stuffing box, wide bearing span, lapped gears, roller bearings, synthetic rubber oil seals, and a unique draw bar arrangement which reportedly contributes to short downtime in the replacement of seals or a stuffing box. Details on the new drive are contained in the manufacturer's bulletin No. 972.



Positive-Displacement Rotary Compressor

A new line of positive-displacement rotary compressors that rival the efficiency and stability of reciprocating machines while matching the compactness and low maintenance of centrifugals has been announced by Fairbanks, Morse & Co., Chicago manufacturers. This is the first compressor of its kind to be produced in the United States for general purpose applications.

The compressor is designed for continuous heavy-duty industrial service handling air, gas or vapor. With a standard capacity range of 800 to 13,000 c.f.m., it is expected to have wide industrial applications for both pressure and vacuum systems.

The compressor is a two-impeller, helical-lobe type, axial-flow, rotary machine with four-lobe power impeller and a secondary impeller with six matching gaps synchronized by timing gears. The impellers rotate with a pure rolling motion and power is transmitted to the secondary impeller through the cushion of compressed gas. There is never any metal-to-metal contact between impellers or with the surrounding casing, making it unnecessary to lubricate the impellers. There can be, therefore, no lubricant contamination of the product and completely oil-free air, gas or vapor is assured. Maintenance is low since there are no valves or pistons to wear.

As the impellers rotate, the lobes and matching gaps part on the intake end creating an intake suction comparable to the suction stroke of a reciprocating piston. Further rotation isolates the interlobal space from the intake and the intermeshing lobes reduce the volume and compress the gas. As the leading edges of the lobes pass the stationary edges of the discharge opening, compressed gas is forced into the discharge line. The interlobal space is reduced to zero before passing the discharge opening, eliminating pockets and gas carry-over. The flow of compressed gas is virtually continuous and pulsation and vibration are kept to an absolute minimum.

Because of its high operating speed, the rotary compressor can be driven efficiently by an induction or synchronous motor, diesel or natural gas engine, or steam or gas turbine.

Plastic-Metal Dry Bearing Material

The bearing material, developed by the Glacier Metal Co. Ltd. of England, is known as DU. In use in various industries in England, this material is available in this country for the first time through an exclusive patent licensing arrangement with United States Gasket Co., Camden, N. J.

DU is composed of a steel backing on which is sintered a thin lining of spherical bronze, impregnated with a mixture of Teflon T.F.E. and 20 per cent lead, a thin layer of which also covers the bearing surface. The T.F.E. lead impregnated bronze structure comprises two completely interlocked sponge-like networks.

The result is a material said to be of very low friction with no slip characteristics, and with wear resistance reportedly up to 100 times greater than that of other types of dry bearings. High thermal conductivity and low thermal expansion, high compressive strength and an operating temperature range from minus 328° F. to plus 536° F. are other properties of the bearing material.

DU is available in strip form in a range of thicknesses from which bushings can be wrapped, thrust washers cut, or hemispherical bearings pressed.

Aluminum Coating Solution

The Celanese Corp. of America announced that it has developed a water-thinned aluminum coating for paper and board that eliminates the hazards of fire and toxicity found in the solvent systems in general use today.

Known as VPC 1006, the compound is a result of joint research by Celanese and Metals Disintegrating Co. Inc., of Elizabeth, N. J. Commercial use by paper coaters will require a blending of a polyvinyl acetate emulsion manufactured by Celanese known as CL 202 and a powdered aluminum product supplied by Metals Disintegrating known as MD 2100. The process for stabilizing aluminum pigment in an aqueous solution is owned by Metals Disintegrating Co. and is subject to licensing by that company.

Ten Knife Chipper

For high capacity chipping, Sumner Iron Works, P. O. Box 1006, Everett, Wash., is building a 53-inch disk, ten-knife horizontal feed chipper.

This is the first machine with a modified convolute face plate design. These face plates set up an "auger action," pulling the wood toward the disk in a smooth uninterrupted flow, thus producing chips, which are reported very high in quality.

Compact Chlorinator

A "V-notch" Chlorinator for low-capacity installations is now available from Wallace & Tiernan Inc., Belleville, N. J.

The Series A-741 Chlorinator is wall-panel mounted. No auxiliary water or drains are required, a variable-orifice is reported gives precise and smooth feed-rate adjustment, and all parts are made of corrosion-resistant plastic, molded for interchangeability. Vacuum operation gives protection against chlorine leaks.

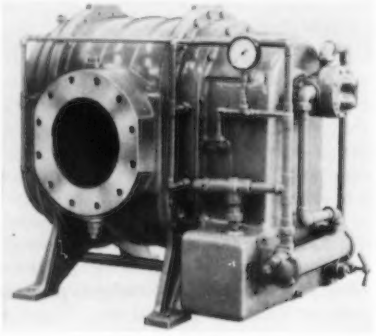
Roots Blower and Gas Pump

Utilizing the Roots rotary positive displacement principle, Roots-Connersville, a division of Dresser Industries at 900 West Mont St., Connersville, Ind., has introduced a new blower designed to achieve more efficient handling of air and gas.

The new blower features a vertical arrangement of the impellers providing horizontal inlet and discharge connections. The drive shaft extends from the lower impeller to match more closely motor shaft heights. An improved segmented waist impeller shape permits safe handling of entrained liquids with an additional advantage of more quiet operation.

A flanged stub shaft design permits a higher pressure rating for a given impeller length to deliver greater displacement without extremely high rotating speeds. This compact design reduces overall dimensions to a minimum. External bearings and separate oil reservoir are eliminated to further reduce the space requirements of the unit. Delivery of completely oil free air or gas is assured by double seals on the shafts . . . a multiple labyrinth seal plus a positive oil seal.

All units are sized for direct connection to low cost moderate and high



speed motors. V-belt drives may also be used for intermediate ratings up to approximately 200 H.P. Speeds are well matched to economical gas or diesel engine speeds, while steam turbine drives can be used with standard speed reducers.

Both blowers, designated Type RAS, and gas pumps, designated Type RGS, have identical volume and pressure ratings. Thirty-six carefully selected sizes are offered to cover a capacity range of from 2,000 to 14,000 c.f.m. at 6 p.s.i.g. and from 1,500 to 8,000 c.f.m. at 10 p.s.i.g.

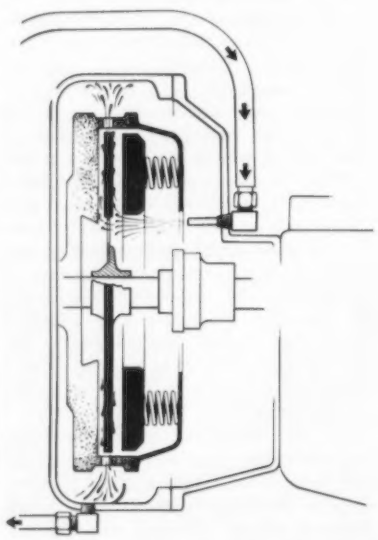
Oil Cooled Clutch for Lift Trucks

An oil cooled clutch that is reported to increase clutch life and eliminate a number of maintenance problems has been developed by Hyster Co., for use in large capacity lift trucks in heavy-duty applications.

Tests at Hyster's proving grounds as well as experience in customer installations where clutch wear has been excessively severe, are reported to show that the new oil cooled unit gives good performance and indicates a life span in the 10,000 hour range. In one particular field test where conventional dry clutches were being replaced every two to six weeks, the oil cooled unit ran 2,500 hours without adjustment and a disassembly check showed virtually no wear, according to the manufacturer.

The new clutch has a constant stream of oil that is directed to the center of the friction disc of the clutch mechanism. This oil, which serves both as a lubricating and cooling element, is carried outward to the perimeter of the disc by centrifugal force through diagonal grooves that criss-cross the clutch face.

During "inching" operations of lift truck movements, the clutch lining rides on a thin film of oil which is said to prolong its life. A side benefit of the oil clutch is that the problems of lubricating clutch bearings and the bendix starting spring are eliminated since all parts are lubricated by an oil bath.



The nine million tons of waste paper used annually in the United States by the paper industry is equivalent to the annual growth of trees in the forests of New York, Pennsylvania, Maryland and West Virginia.

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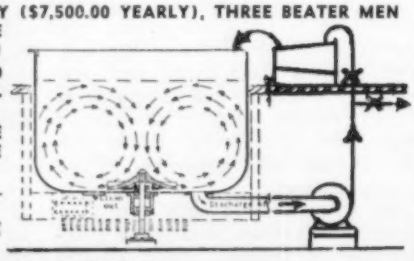


APMEW, Inc., P. O. 1, Glen Falls, N. Y.

NEW LITERATURE

A-C TOTALLY-ENCLOSED D-C MOTORS. (Bulletin 53B8904) Tells how you get more dependable dc power; how the cooling system works and lists dimensions and ratings. **Allis-Chalmers Mfg. Co.**, Box 512, Milwaukee 1, Wis.

B&W SEAMLESS WELDING FITTINGS AND FORGED STEEL FLANGES. (Bulletin FB-504) Explains how the user will save time and money by ordering fittings and flanges which are produced to close dimensional tolerances. **Tubular Products Div., Babcock & Wilcox Co.**, Beaver Falls, Pa.

CENTURY PERFORMANCE RATED MOTORS AND GENERATORS. (Form 270) This is their 1958 application guide and is designed to make motor selection easy. **Century Electric Co.**, 18th & Pine Sts., St. Louis 3, Mo.

BAILEY BOLOMETER TRANSMITTER. (Product Spec E66-1) Provides details of operation, installation drawings, and wiring diagrams. **Bailey Meter Co.**, 1050 Ivanhoe Rd., Cleveland 10, Ohio.

DE LAVAL PLATE HEAT EXCHANGERS. (Bulletin) Gives mechanical specifications and features, complete dimensions, list of applications and describes inherent benefits of these exchangers. **De Laval Separator Co.**, Poughkeepsie, N. Y.

ESH-NL NON-LUBRICATED COMPRESSORS. (Form 3251) Describes this new line, built for heavy-duty service where the air or gas being compressed cannot be allowed to contact oil or other lubricants. **Ingersoll-Rand**, 11 Broadway, New York 4, N. Y.

EMERI-CRETE KURE. (Data Sheet) Describes the application on new and old concrete floors. Also explains how use of this agent permits later resilient tiling without requiring special cleaning techniques. **Walter Maguire Co.**, 60 E. 42nd St., New York 17, N. Y.

CLARKSON FEEDERS. (Bulletin 584) Features photos and data on new materials, design and performance of this dependable low cost unit. Gives particular reference to feeding sulphuric acid for pH control of cooling tower water. **Clarkson Co.**, 564 Market St., San Francisco 4, Calif.

CLARKLIFT ELECTRIC 20. (4p Brochure) Includes full dimensions, specifications and performance characteristics, as well as photographs and drawings which illustrate the various parts. **Clark Equipment Co., Industrial Truck Div.**, Battle Creek, Mich.

DISSOLVED OXYGEN ANALYZER. (Bulletin 0-4014) Gives comprehensive information on the Model 70 which has been designed for continuous automatic analysis of dissolved oxygen in high purity water. **Beck/Process Instruments Div.**, Fullerton, Calif.

FLOW INDICATORS. (Bulletin 18W) Describes their fine line of flow indicators for pipeline installation to give positive visual indication of flow conditions. **Dept. M-H, Schutte & Koerting Co.**, Cornwells Heights, Bucks County, Pa.

G-E SILICONES. (Bulletin CDS-129) Discusses their major silicone products and some of them any uses for them. Also lists G-E literature about silicones. **General Electric Co.**, Waterford, N. Y.

HYSTER'S LOAD-GRAB CLAMP. (Form 1532) Tells how problems encountered in handling paper rolls and other cylindrical loads and boxes and bales can be solved with this clamp. Also contains specifications and description. **Myster Co.**, 2902 N. E. Clackamas St., Portland 8, Ore.

HIGH PRESSURE CHEMPUMPS. (Bulletin 1070) Illustrates and describes a group of typical pumps available for high pressure fluid handling. **Chempump Corp.**, 1300 E. Mermaid Lane, Philadelphia 18, Pa.

HIGH-PRESSURE JETTING OF REGENERATIVE AIR PREHEATERS. (Reprint) Contains technical information on an effective method for removing insoluble deposits from preheater elements. **Dowell Inc.**, P. O. Box 536, Tulsa 1, Okla.

INDIANA PERMANENT MAGNETS. (Catalog 19) Describes stock permanent magnets, magnetizers, and demagnetizers. Also lists Cast Alnico V magnets and Sintered Alnico II magnets available for shipment in experimental quantities. **Indiana Steel Products Co.**, Valparaiso, Ind.

INSTRUMENTATION OF WATER AND WASTE TREATMENT IN PULP AND PAPER MILLS. (Reprint) Discusses the benefits to be gained from instrumentation. **Fischer & Porter Co.**, Hatboro, Pa.

INCREASED PHYSICAL PROPERTIES OF LUKENS "T-1" STEEL. (Brochure) Contains a table which summarizes and illustrates the various grades in which "T-1" steel plates are now available. **Lukens Steel Co.**, Coatesville, Pa.

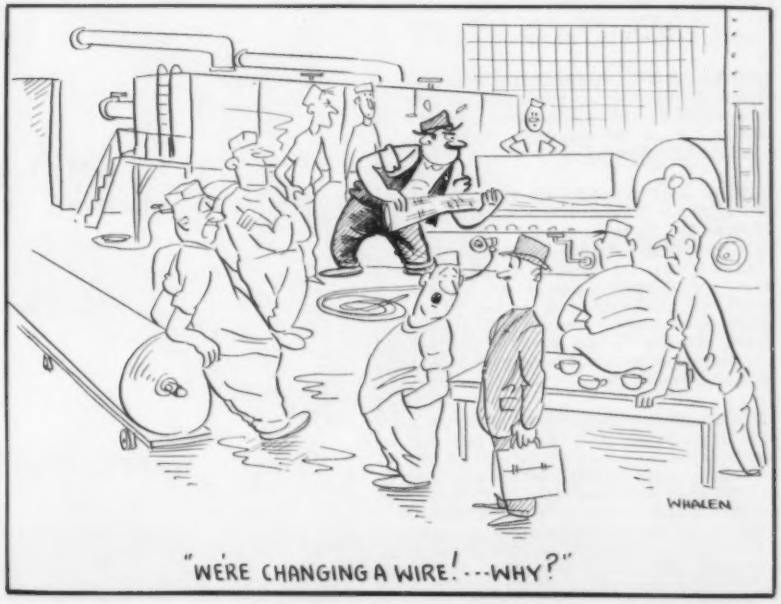
KUHNS DUCTILE IRON PIPE LOCK COUPLINGS. (Catalog 1-PL) Lists specific cost-saving advantages of the "K" series and provides installation illustrations and recommendations for their use. **Kuhns Bros. Co.**, 1800 McCall St., Dayton, Ohio.

METAL & THERMIT'S PAST 50 YEARS. (28p Brochure) Describes the various activities that the company has undertaken since its founding 50 years ago. The booklet has four-color covers and two-color treatment throughout. **Metal & Thermit Corp.**, 100 Park Ave., New York 17, N. Y.

KOPPERS, THE COMPANY, ITS PRODUCTS AND ACTIVITIES. (Booklet) Tells how the company, established as a service organization to the steel industry, has grown and diversified with steel, wood, coal and chemicals during the last half-century of progress. **Koppers Co.**, Seventh Ave. at Grant St., Pittsburgh 19, Pa.

HILLIARD SLIP CLUTCHES AND COUPLINGS. (Bulletin SC2) Depicts typical installation on speed reducers, conveyors, gearing and tension control. Also explains how they extend the life of machinery. **Hilliard Corp.**, Elmira, N. Y.

MAXIMUM ALLOWABLE WORKING PRESSURES FOR BOILER TUBES. (Data Card 157-A) Lists the maximum allowable working pressures, by popular tube sizes, for electric resistance welded boiler tubing. **Babcock & Wilcox Co.**, Beaver Falls, Pa.



MILTON ROY PRODUCTS. (Data Sheets) F-57-2 illustrates system for continuous and automatic starch cooking. E-57-2, Pulse generators stroke liquid pistons to recycle gases in pilot plants. E-57-3, pressure maintenance problems in core analysis. F-57-1, nutrients metered to kraft mill wastes to effect treatment. A-58-2, control of chemical concentration by continuous titration. **Milton Roy Co.**, 1300 E. Mermaid Lane, Philadelphia 18, Pa.

PAPER COATING DEFOAMER. (Report PA-14)) Contains technical information on Nopco 1497-B, a water-dispersible defoamer for protein-pigment paper coatings. **Paper Chemicals Div., Nopco Chemical Co.**, Harrison, N. J.

ROSS AIR SYSTEMS. (Bulletin S-4) Deals with Ross ovens, dryers and heaters used to produce the "engineered atmospheres" required for paper drying and conditioning; pulp and paper mill ventilating, heating and cooling; etc. **J. O. Ross Engineering Div., Midland-Ross Corp.**, 444 Madison Ave., New York. N. Y.

REEVES VARI-SPEED MOTOR PULLEY. (Bulletin V-582) Contains illustrated sales copy, tables and engineering drawings on their different models. **Reeves Pulley Co., Div. of Reliance Electric & Engineering Co.**, Columbus, Ind.

RED-RAY RADIANT GAS BURNERS. (Bulletin 108) Tells how to solve your drying and processing problems. **Red-Ray Mfg. Co., Inc.**, 318 Cliff Lane, Cliffside Park, N. J.

SILICONE INSULATED MOTORS AND TRANSFORMERS. (Code 10-106) Details and illustrates working "case history" examples and discusses both resinous and rubber-like systems. **Dow Corning Corp.**, Midland, Mich.

SPECIAL HAZARD FIRE PROTECTION. (Booklet) Shows advanced methods for Special Hazards fire protection which have been developed during more than 85 years of continuing research. This highly technical subject is presented in a manner easy to understand by those who are not technically trained. **Grinnell Co.**, Providence 1, R. I.

THE BLUE OX. (4p Brochure) Provides design details and specifications of this rubber-tired, four-wheel-drive timber skidder. **Four Wheel Drive Auto Co.**, Clintonville, Wis.

TENOX ANTIOXIDANTS FOR MORE EFFECTIVE FOOD PACKAGING MATERIALS. (Bulletin G. 104) Describes how two principal food-approved antioxidants, can be applied in emulsion form to unwaxed papers and paperboard, or in the case of waxed liners, board stock, etc., how these can be added directly to the paraffin prior to coating. **Eastman Chemical Products Inc.**, Kingsport, Tenn.

TITANIUM WELDING TECHNIQUES. (32p Handbook) Outlines the do's and don'ts for successful welding and covers in detail fusion-welding equipment and procedures, resistance-welding equipment and procedures, a study of typical weldments, and methods for evaluating weld quality. **Titanium Metals Corp. of America**, 233 Broadway, New York 7, N. Y.

PRESENTS DU. (Bulletin DU-458) Includes detailed information on this high-performance, self-lubricated bearing material and describes its advantages in typical as well as unusual bearing applications. Also gives comparative test and field service data. **Special Products Dept., U. S. Gasket Co.**, Camden 1, N. J.

SURFACTANTS LISTED. (78p Bound Reprint) Gives a general summary of the synthetic detergent field and its most recent developments. 75 pages of tables list alphabetically over 2000 U.S. trade name products, together with the manufacturer. Also lists 250 manufacturers of these products in the Appendix. Price $2.50. Available from **John W. McCutcheon, Inc.**, 475 Fifth Ave., New York 17, N. Y.

BAUER PROCESSING EQUIPMENT. (Bulletin 58) Provides application data on their continuous and rapid cycle digesters, Centri-Cleaners, double and single revolving disk refiners, "Pump Through" refiners and Pressafiners. Also mentions the technical service their project division offers to pulp, paper and board mills. **Bauer Bros. Co.**, Springfield, Ohio.

COCHRANE MULTIPORT RELIEF VALVES. (Bulletin 5200-A) Describes features of these valves for steam systems. Also includes installation diagrams, data on selecting and specifying and specifications for vertical, horizontal and angle styles. **Cochrane Corp.**, 17th St. & Allegheny Ave., Philadelphia 32, Pa.

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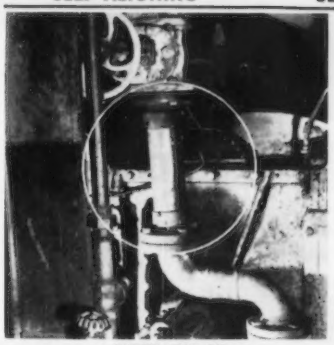

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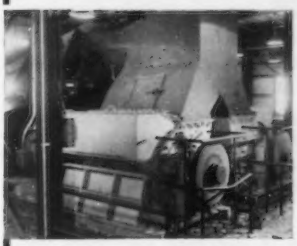

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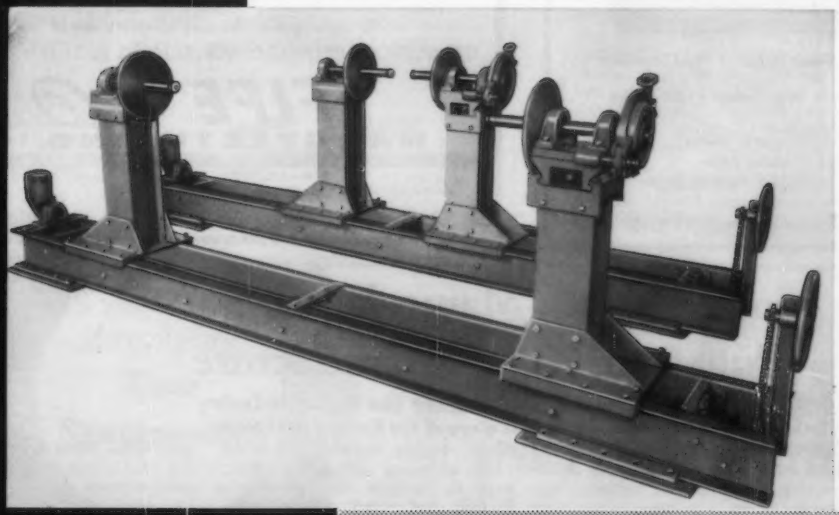

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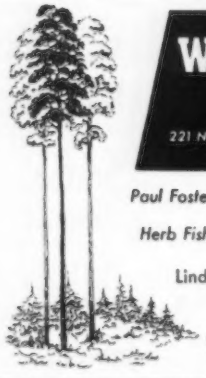

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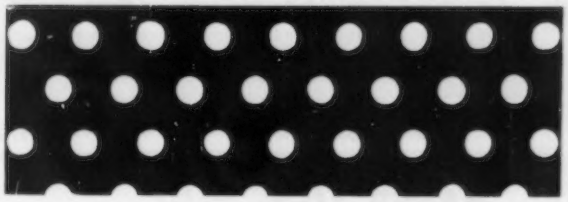

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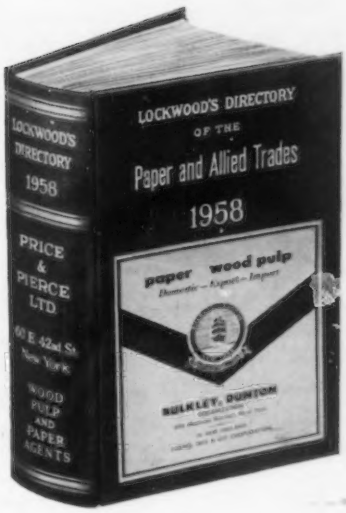

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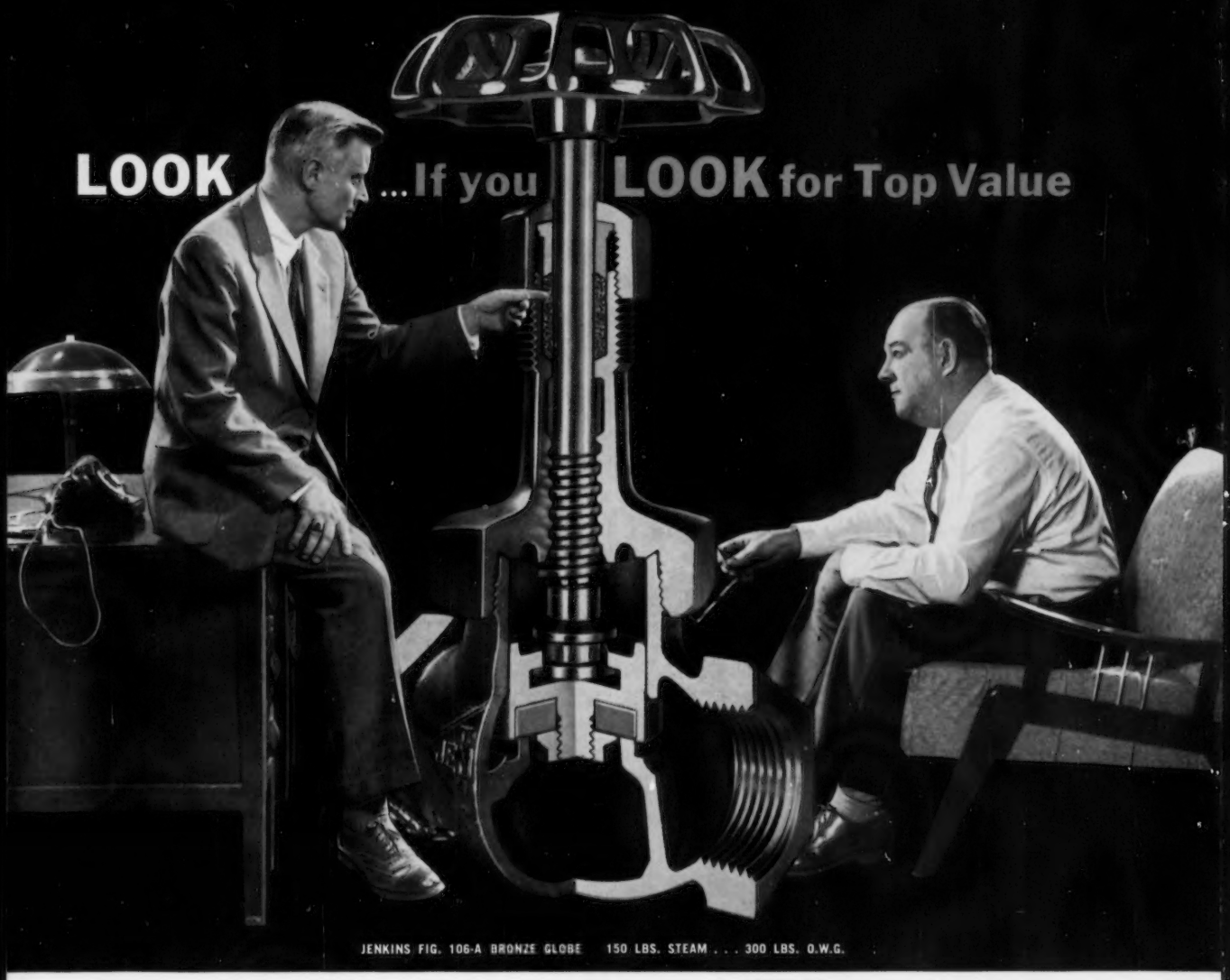

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